**IMPORTANT**

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

# This PHOTOFACT Folder Set is

## WIRE-SEALED FOR YOUR PROTECTION

## to guarantee completeness of contents

**DO NOT ACCEPT IF SEAL HAS BEEN BROKEN**

**TO OPEN** ***JUST DO THIS:***

**1**

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

**2**

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

**3**

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

**4**

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

*Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .*

**IMPORTANT**

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

# The PHOTOFACT® Servicer

SET 492 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JULY 1960

## CONTENTS PHOTOFACT SET 492


| TRADE NAME AND MODEL | SET AND FOLDER NO. |
|---|---|
| **TELEVISION RECEIVERS** | |
| TRAV-LER | |
| 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29) | 492-1 |
| ZENITH | |
| E2458E, EU, R, RU, W, WU, E2460M, MU, R, RU, E3012H, R, E3013H, E3014W, E3015L (Ch. 16E27, U, Q, S-48434) | 492-2 |
| **PRODUCTION CHANGE BULLETIN 240** | |
| CHANNEL MASTER | |
| 6506 | 492-3 |
| DEWALD | |
| N-5000B | 492-3 |
| GENERAL ELECTRIC | |
| T-106B, T-107B | 492-3 |
| SILVERTONE | |
| 58A, 59A (Ch. 528.53640, 528.59670) | 492-3 |
| **OTHER EQUIPMENT** | |
| ARVIN | |
| 2093 (Ch. 11.48200) | 492-4 |
| AUTOMATIC | |
| CL-75 | 492-5 |
| TR-12B, TR-56 | 492-6 |
| BOULEVARD | |
| 5T17 | 492-7 |
| CAPITOL | |
| 932 | 492-8 |
| CORONADO | |
| PH20-4025A | 492-9 |
| PH20-4026A, PH20-4027A | 492-10 |
| DYNAMIC | |
| DS32-100, ST-100, SX-24 (Ch. 100) | 492-11 |
| EICO | |
| HF-22, HF-35 | 492-12 |
| MOTOROLA | |
| A2G, N, P, W, C1N, W, C2B, P, W, C3G, -1, C3S, -1, C3W, -1 (Ch. HS-745, HS-749, HS-750) | 492-13 |
| 10MX | 492-14 |
| SK36M, SK37CW, SK38B (Ch. HS-767, HS-781) | 492-15 |
| PHONOLA | |
| 2659, 3159 | 492-16 |
| 2959, 3059 | 492-17 |
| ROLAND | |
| 1-0931, 2-0931 | 492-18 |
| 41-881 | 492-19 |
| SILVERTONE | |
| 7, 8, 9, 10 (Ch. 132.45601, 132.45602) | 492-20 |
| 211, 212, 213 (Ch. 132.43601) | 492-21 |
| 262A, 263A (Ch. 528.59650) | 492-22 |
| TOSHIBA | |
| 3TP-315Y | 492-23 |
| TRAV-LER | |
| TT591 (Tape Recorder) | 492-24 |
| TRUETONE | |
| DC3085A, B | 492-25 |
| WESTINGHOUSE | |
| H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1) | 492-26 |
| ZENITH | |
| Royal 675L (Ch. 6CT41Z1) | 492-27 |

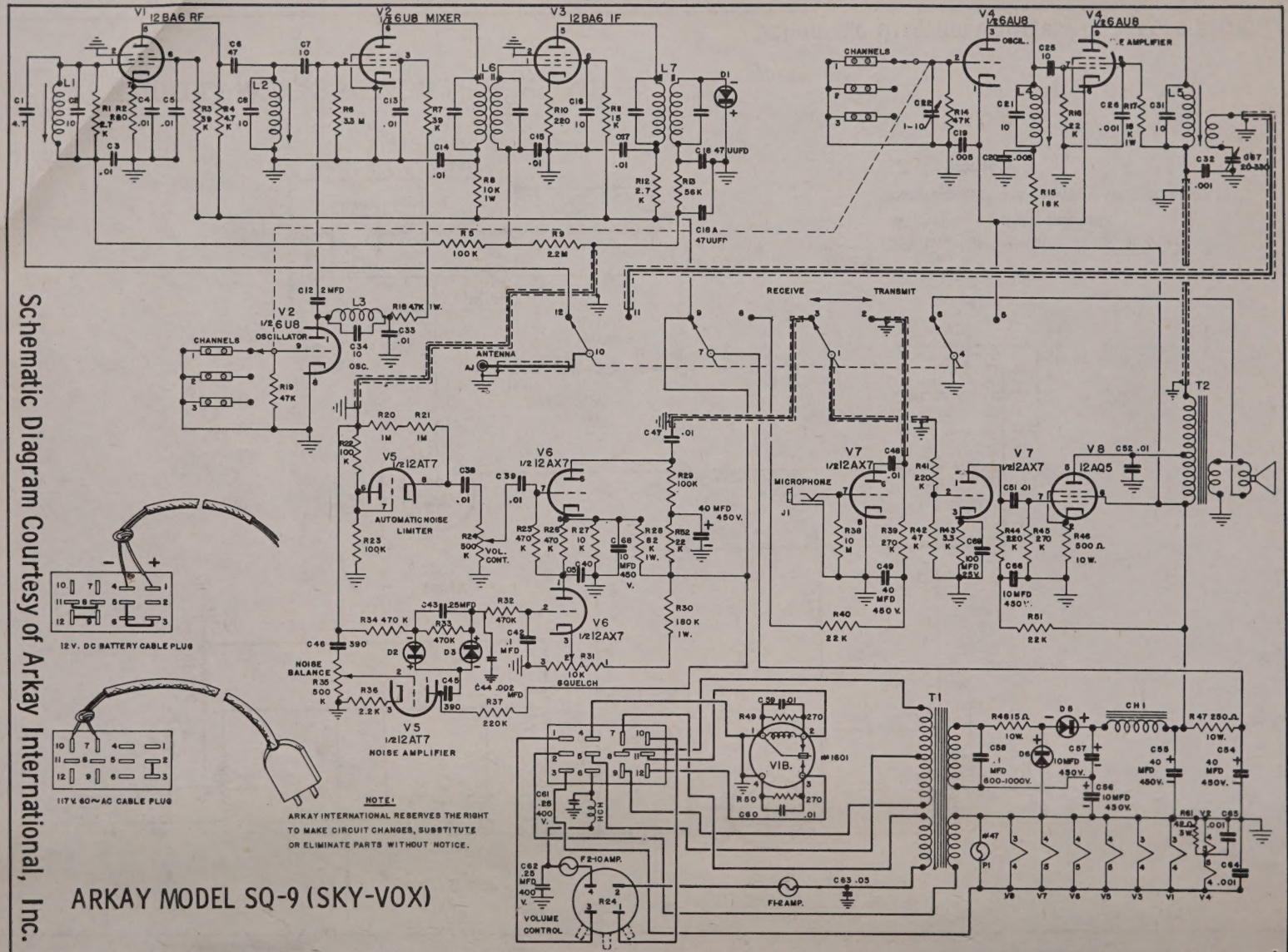

This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

## IN THIS ISSUE OF THE SERVICER:

Ampex Models
900, 920 Series

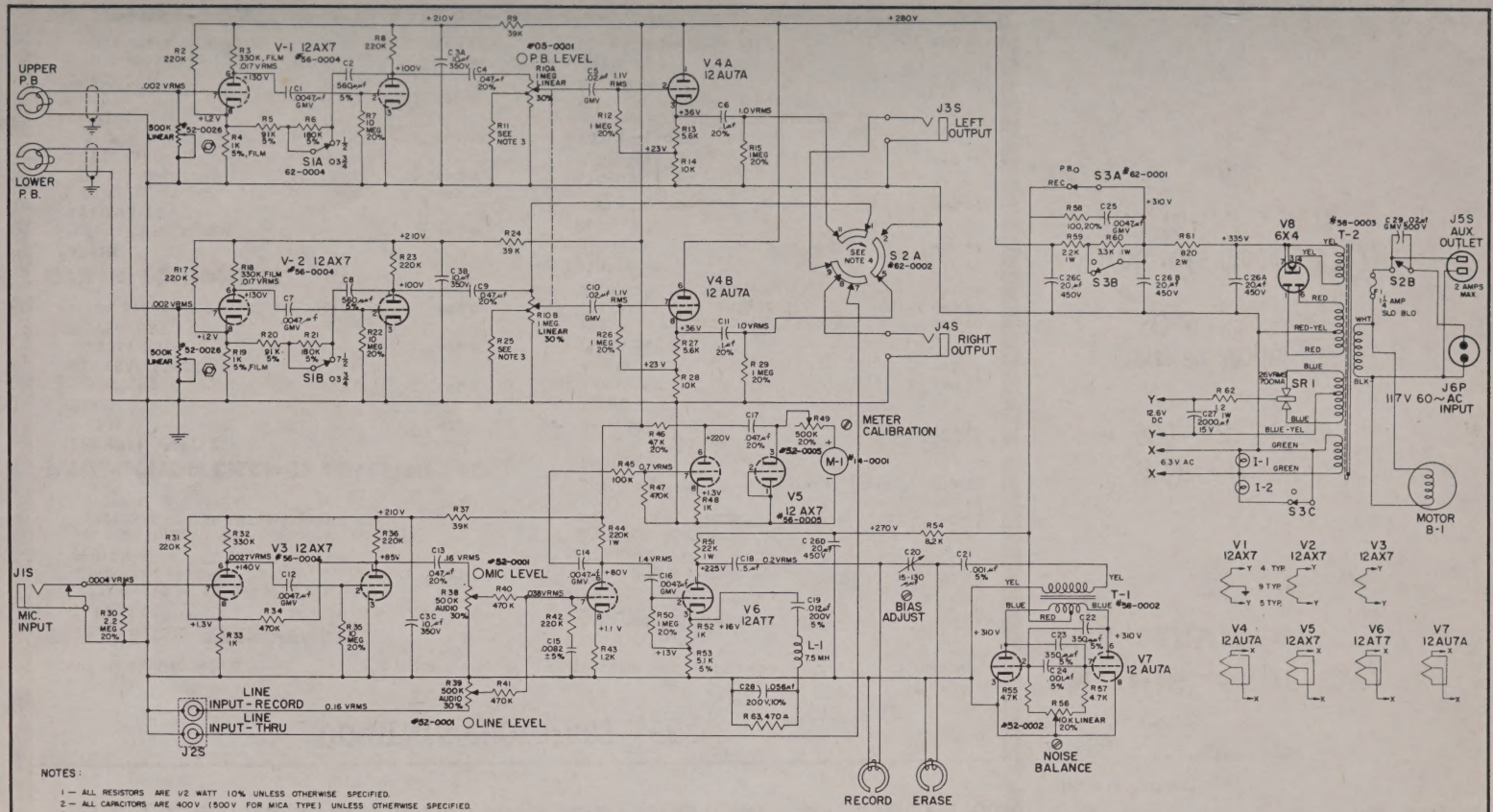
Arkay Model
SQ-9 (Sky Vox)

Motorola Models 37F1,
37F2 (CH. HS-541)




Schematic Diagram Courtesy of Arkay International, Inc.

# ARKAY MODEL SQ-9 (SKY-VOX)



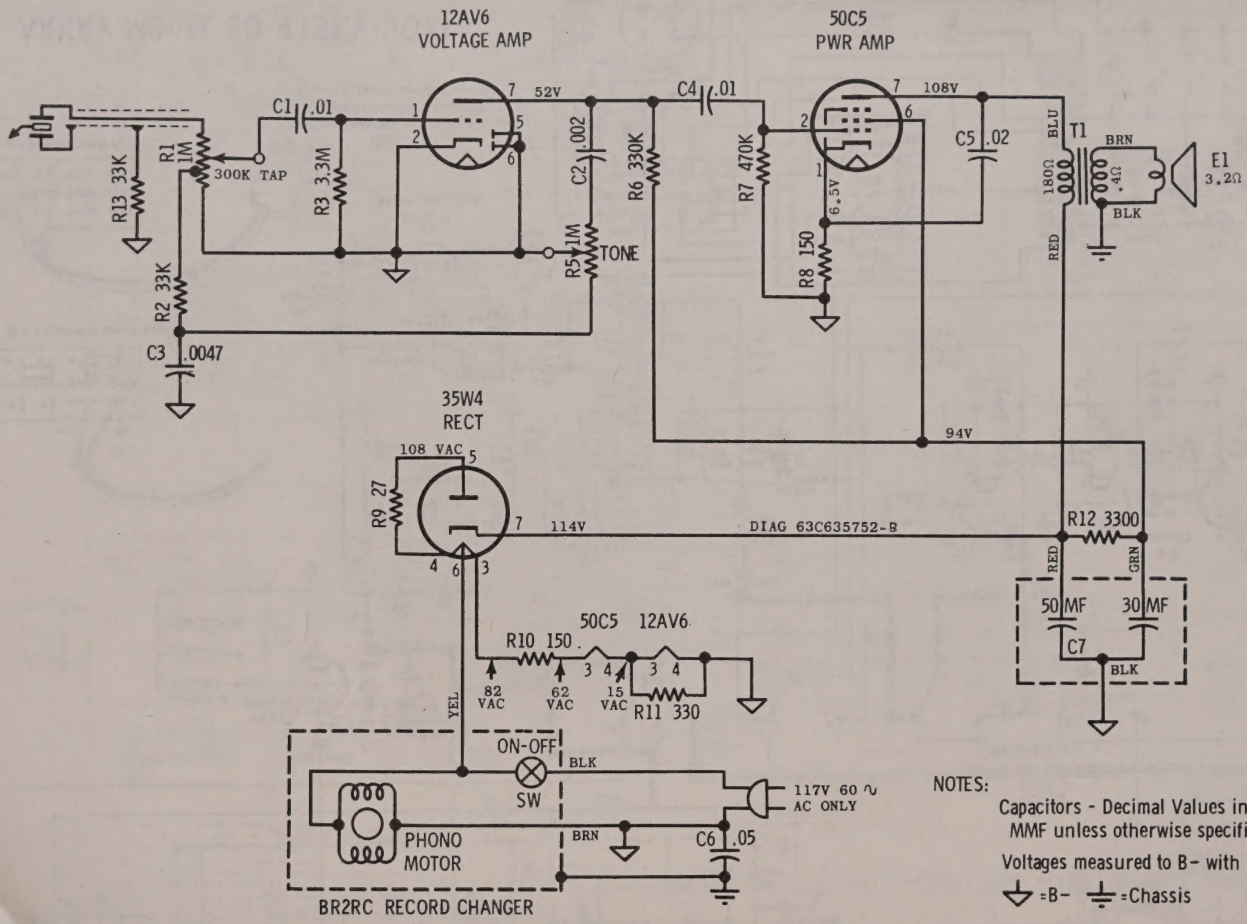

NOTES:

1 — ALL RESISTORS ARE 1/2 WATT 10% UNLESS OTHERWISE SPECIFIED.
2 — ALL CAPACITORS ARE 400V (500V FOR MICA TYPE) UNLESS OTHERWISE SPECIFIED.
3 — R11 AND R25 ARE FACTORY SELECTED TO MATCH TRACKING OF R10, VALUES RANGE FROM 56K TO 82K.
4 — S2 SHOWN IN OFF POSITION VIEWED FROM SHAFT END OF SWITCH.
1 "OFF" (LEFT & RIGHT OUTPUT CONNECTED TO LINE INPUT-THRU.)
2 "MONITOR" (LEFT & RIGHT OUTPUT CONNECTED TO LINE INPUT-THRU.)
3 "SINGLE" (LEFT & RIGHT OUTPUT CONNECTED TO UPPER PLAYBACK CHANNEL)
4 "STEREO" (LEFT & RIGHT OUTPUT CONNECTED TO UPPER & LOWER PLAYBACK CHANNELS RESPECTIVELY)
5 — ALL VOLTAGES MEASURED WITH 117V AC LINE INPUT WITH MACHINE IN RECORD MODE, 7 1/2 IPS TAPE SPEED, LEVEL CONTROLS FULL CLOCKWISE ROTATION. DC VOLTAGES MEASURED WITH 20,000 OHM PER VOLT METER. AC VOLTAGES MEASURED WITH AC VACUUM TUBE VOLTMETER (HP400D OR EQUAL) AT 500 CYCLES SUBSTITUTING A 1K RESISTOR FOR RECORD HEAD & SUBSTITUTING A 20K, 10 WATT RESISTOR FOR V7 (PINS 1 & 6 TIED TOGETHER & THE RESISTOR BETWEEN THIS JUNCTION & PIN 3).

For mechanical information see PHOTOFACT Folder 5 in Set 452

# AMPEX MODELS 900, 920 SERIES

Schematic Diagram Courtesy of Ampex Audio, Inc.




NOTES:

Capacitors - Decimal Values in MF, all others in MMF unless otherwise specified.

Voltages measured to B- with VTVM. Tol. ± 10%

⏚ =B- ⏚ =Chassis

## MOTOROLA MODELS 37F1, 37F2 (CH. HS-541)

Schematic Diagram Courtesy of Motorola Inc.

PHOTOFACT® Folder

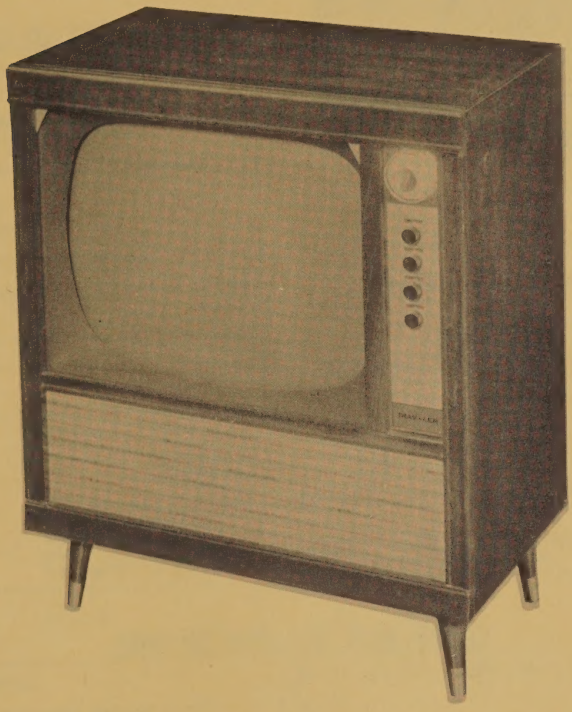
# TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

## IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 921-K-810M (CH. 1150-29)

TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 492 FOLDER 1

# TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

## DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 921-K-810

Note: For chassis removal, follow steps 1 thru 7 below. For chassis and picture tube removal (as a unit), follow steps 1, 2, and 4; then remove speaker leads and 7 bolts holding wood base to cabinet.

1. Remove 8 wood screws holding rear cover. Remove antenna leads. Remove rear cover.
2. Remove 6 push-on type knobs from the front of the cabinet.
3. Remove speaker leads, high voltage lead, picture tube socket, yoke plug, and picture tube bracket ground lead.
4. Remove 4 nuts and 1 wood screw holding Tuner-Front Control bracket.
5. Remove 2 screws (one on each side of the chassis) holding chassis to chassis mounting bracket.
6. Remove 2 bolts from under cabinet holding chassis.
7. Remove chassis.

PICTURE TUBE REMOVAL

1. Remove chassis and picture tube as a unit.
2. Remove high voltage lead, picture tube socket and yoke plug.
3. Loosen picture tube mounting strap and remove picture tube.

MODEL 921-K-810M (CH. 1150-29)

**CAUTION**

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

| TRADE NAME | Trav-Ler | Models | Chassis |
|---|---|---|---|
| | | 921-K-810B, M ..... | 1150-29 |
| | | 921-MT-805B, M ..... | 1155-29 |
| MANUFACTURER | Trav-Ler Radio & Tele. Corp., 571 West Jackson Blvd., Chicago 6, Illinois | | |
| TYPE SET | Television Receiver | | |
| TUBES | Fifteen | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles | RATING | 140 Watts, 1.3 Amp. @ 117 Volts AC |
| TUNING RANGE | Channels 2 thru 13 VHF, Video IF 45.25MC, Sound 41.25MC (Intercarrier) | | |

## SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

FUSE DEVICE

A 5.5Ω fusible resistor is used for low voltage power supply protection. (For location, see R85 in Photo "Chassis - Top View".)

TUNER OSCILLATOR ADJUSTMENTS

For VHF Oscillator touch-up, remove plug in right side of cabinet.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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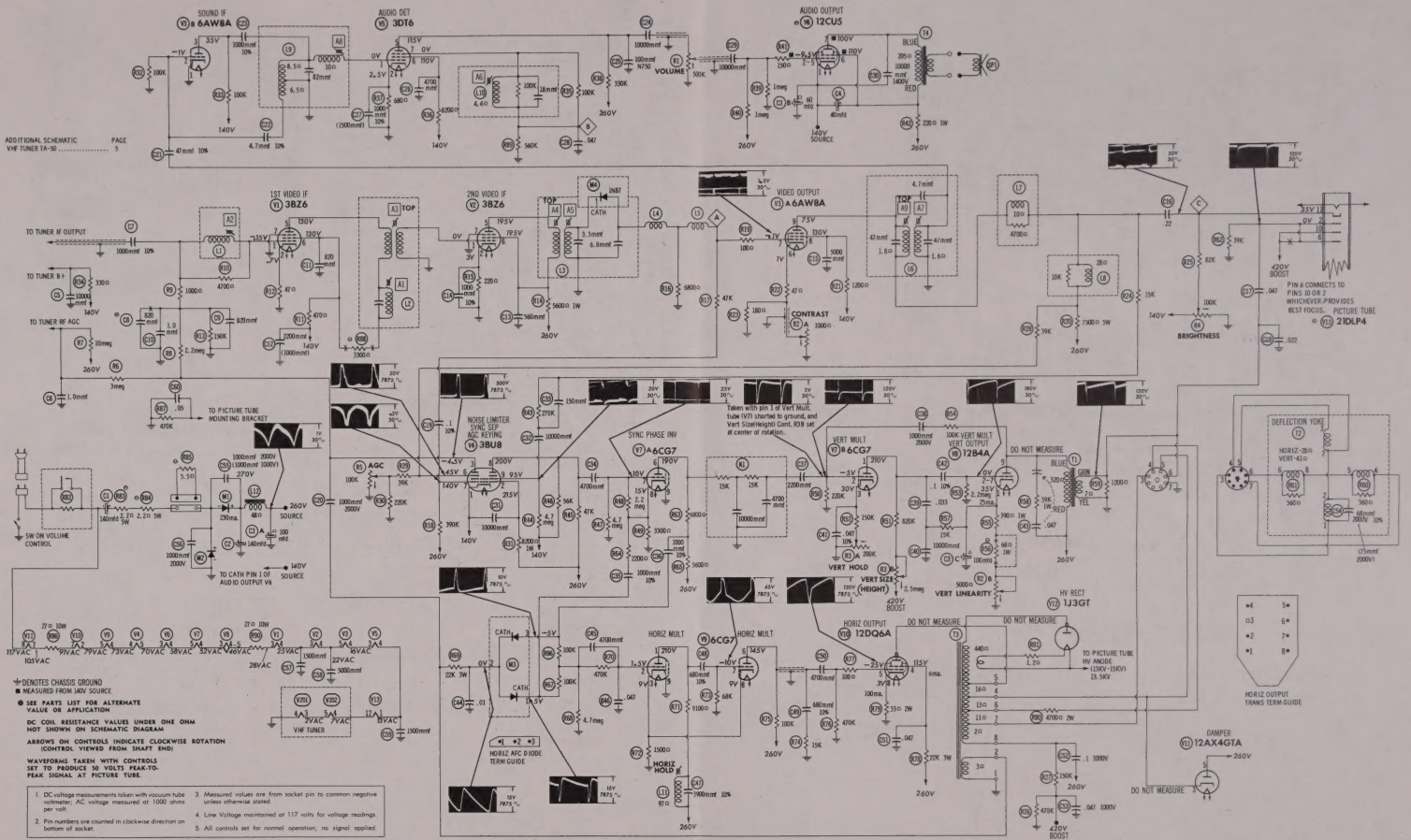
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

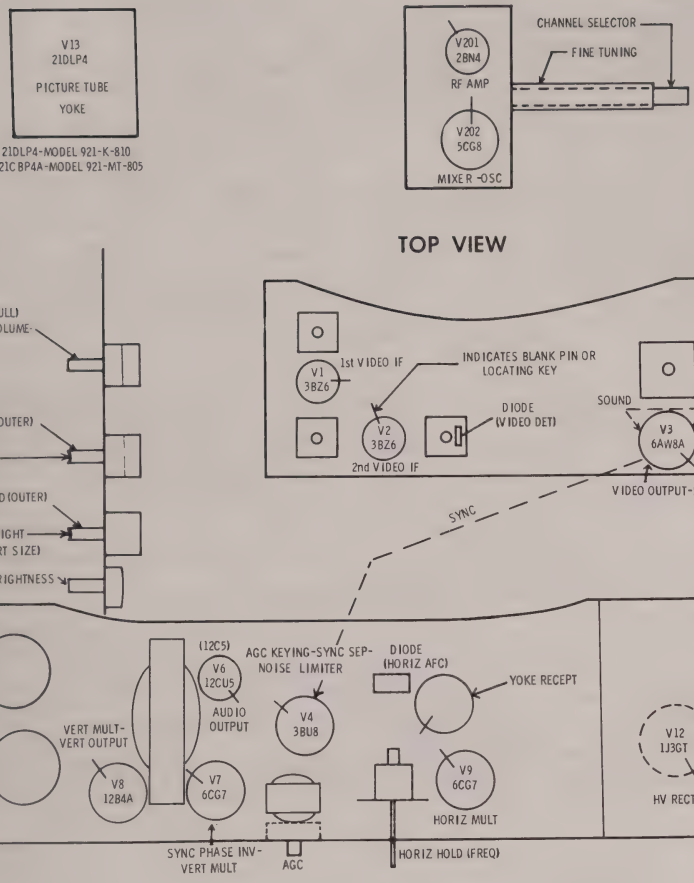
JA924


SOUND IF V10 6AW8A
AUDIO DET V5 3DT6
AUDIO OUTPUT V6 12CU5
VOLUME
BLUE
RED
SPKR
ADDITIONAL SCHEMATIC VHF TUNER TA-50 ..... PAGE 5
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
VIDEO OUTPUT V3 A6AW8A
TO TUNER IF OUTPUT
TO TUNER B+
TO TUNER RF AGC
TO PICTURE TUBE MOUNTING BRACKET
NOISE LIMITER SYNC SEP AGC KEYING V4 3BU8
SYNC PHASE INV V7 A6CG7
VERT MULT V7 B 6CG7
VERT OUTPUT V8 12B4A
DO NOT MEASURE
VERT HOLD
VERT SIZE (HEIGHT)
VERT LINEARITY
CONTRAST
BRIGHTNESS
DEFLECTION YOKE
HORIZ-280 VERT-410
420V BOOST
PIN 6 CONNECTS TO PINS 10 OR 2 WHICHEVER PROVIDES BEST FOCUS. PICTURE TUBE V13 21DLP4
HV RECT V12 1J3GT
HORIZ OUTPUT V10 12DQ6A
HORIZ MULT V9 6CG7
HORIZ MULT
HORIZ HOLD
HORIZ AFC DIODE TERM GUIDE
HORIZ OUTPUT TRANS TERM GUIDE
TO PICTURE TUBE HV ANODE (15KV-15KV) 13.5KV
DAMPER V11 12AX4GTA
SW ON VOLUME CONTROL
TO CATH PIN 1 OF AUDIO OUTPUT V6
260V SOURCE
140V SOURCE
420V BOOST SOURCE
VHF TUNER
DENOTES CHASSIS GROUND
MEASURED FROM 140V SOURCE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1960
TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

FOLDER 1

# TUBE PLACEMENT CHART




# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

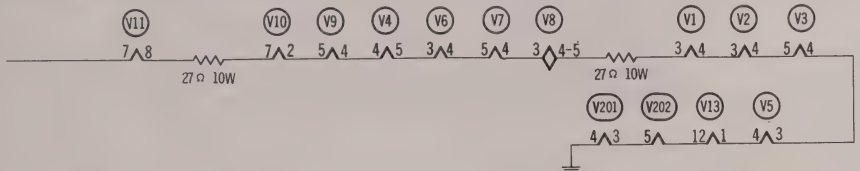
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V13
No vertical deflection V7, V8
Poor vert. linearity or foldover V7, V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, Rectifiers (B+)
Vert. off freq. V7, V8
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V13
Has pic, no sound V3, V5, V6
Overloaded picture V4

SYNC FAILURE
No vert. sync V4
No horiz. sync V4, Diode (Horiz. AFC)
No vert. or horiz. sync V4

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)




SET 492 FOLDER 1

TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

FOLDER 1

# ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: Al thru A9 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil . GENERAL CEMENT #9296, 9297
WALSCO # 2546, 2547

VIDEO IF ALIGNMENT

Set Contrast fully clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

| | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis. | 44MC (10MC Swp.) | 41.25MC | Any non-interfering channel | Vert. Amp. thru 47K to point Ⓐ. Common to chassis. (Across Video Det. load.) | Al | Adjust to place marker in 41.25MC trap notch as in Fig. 1. |
| 2. | " | " | 42.75MC 45.75MC | " | " | Mixer Plate Coil & A2 thru A5 | Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate Coil and A2 for maximum gain, A3 and A4 to shape high frequency side of response curve and A5 to shape low frequency side. |

SOUND IF ALIGNMENT

Connect an output meter across the speaker voice coil.
Connect the DC probe of the VTVM to point Ⓑ. Common to chassis. Tune in a strong air signal and adjust A6 for maximum output.
If two peaks occur, use the one resulting in the highest reading on the VTVM.
Reduce the signal strength by disconnecting the antenna. Adjust A7 and A8 for maximum undistorted sound. Further reduce the signal strength by moving the antenna lead further away. Retouch A7 and A8 for maximum undistorted sound.
Repeat the entire procedure if necessary.

4.5MC TRAP ALIGNMENT

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 3. | High side thru .05mfd to point Ⓐ. Low side to chassis. | 4.5MC (Unmod.) | Any non-interfering channel | AC probe to point Ⓒ. Common to chassis. (Use 0-10 VAC scale.) | A9 | Adjust for MINIMUM deflection. |

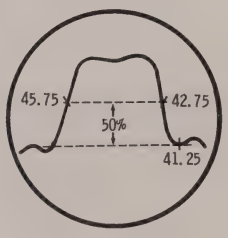
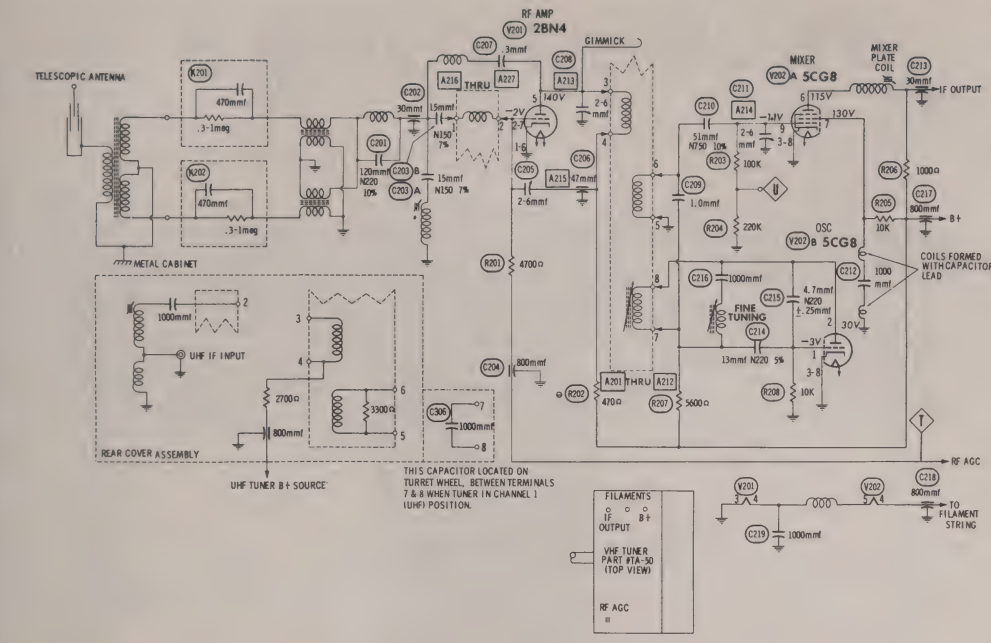


FIG.1

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 12




A PHOTOFACT STANDARD NOTATION SCHEMATIC

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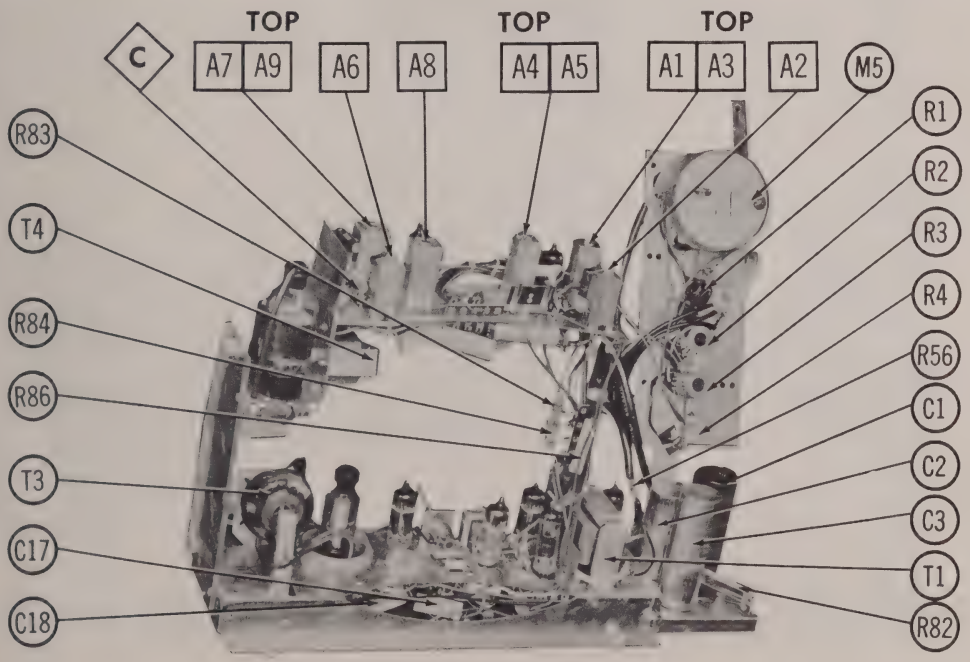
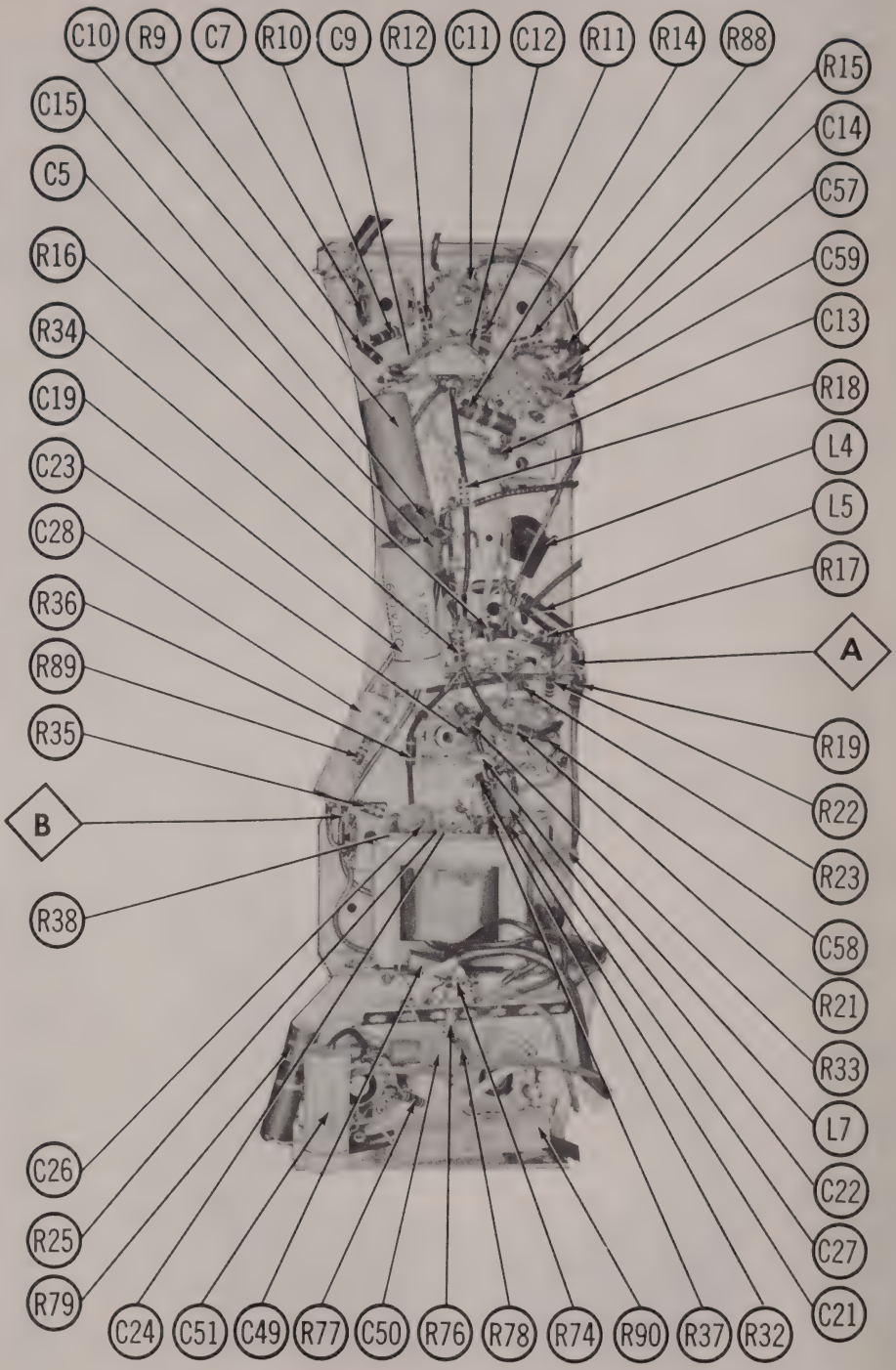
## VHF TUNER TA50

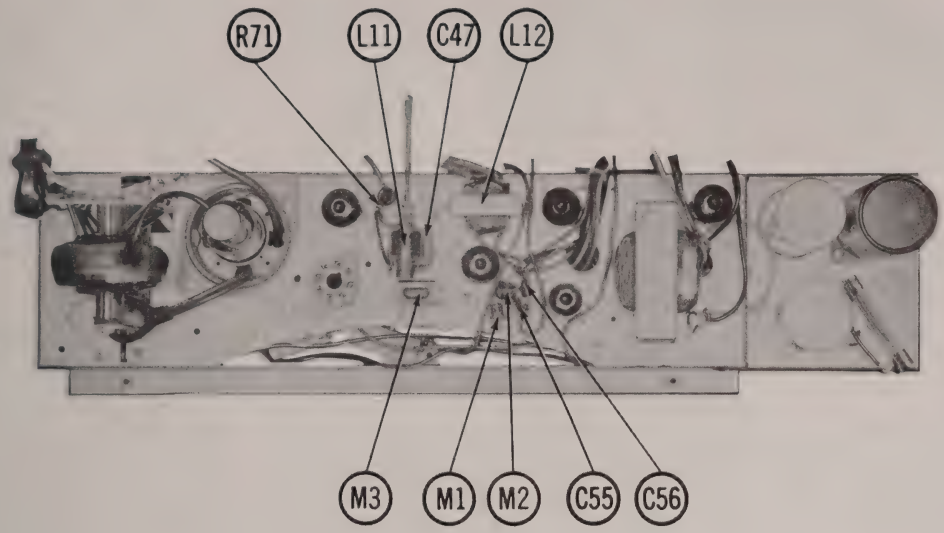



## CHASSIS - FRONT VIEW

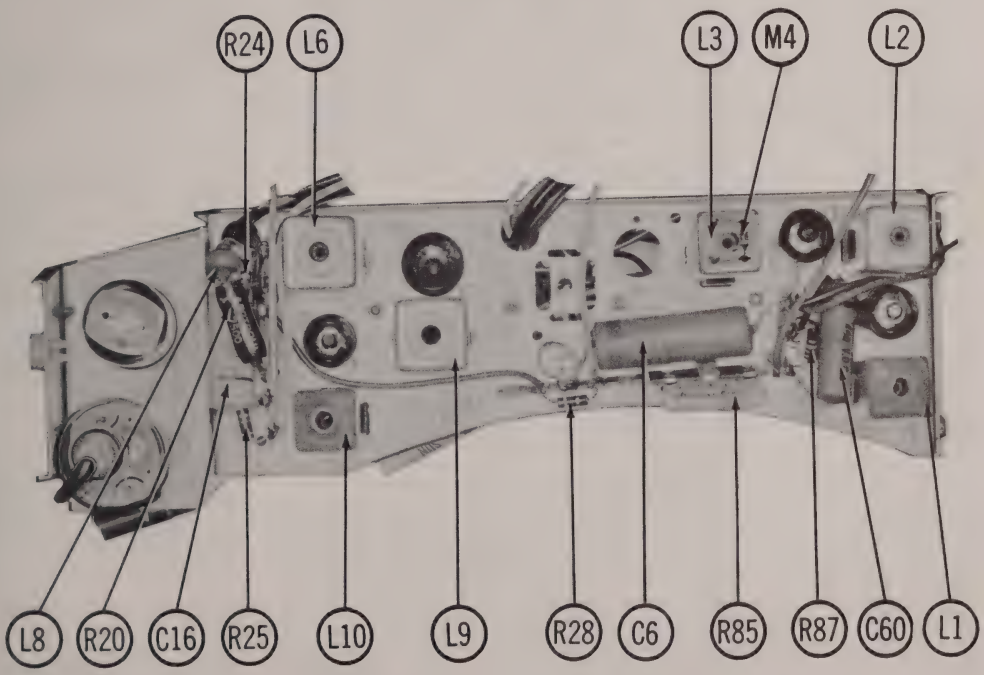
SET 492 FOLDER 1




UPPER CHASSIS - BOTTOM VIEW




LOWER CHASSIS - TOP VIEW




UPPER CHASSIS - TOP VIEW

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE | TYPE |
|---|---|---|
| V1 | 1st Video IF Amp. | 3DZ8 |
| V2 | 2nd Video IF Amp. | 3DZ6 |
| V3 | Video Output – Sound IF Amp. | 6AW8A |
| V4 | AGC Keying - Sync Sep. - Noise Limiter | 3DU8 |
| V5 | Audio Det. | 3DT6 |
| V6 | Audio Output | 13CU5 (13C5) * |
| V7 | Sync Phase Inverter - Vert. Mult. | 6CG7 |
| V8 | Vert. Mult. - Vert. Output | 12BH4A |
| V9 | Horiz. Mult. | 6CG7 |
| V10 | Horiz. Output | 12DQ6A |
| V11 | Damper | 12AX4GTA |
| V12 | HV Rect. | 1J3GT |

* Alternate

## PICTURE TUBE

| ITEM No. | REPLACEMENT DATA: TRAV-LER PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|
| V13 | 21DLP4 *<br>21CBP4A † | 21CBP4A ① | 21DLP4 ①<br>21CBP4A ① | 21DLP4 ①<br>21CBP4/21CBP4A① | 21DLP4 ②<br>21CBP4/21CBP4A② | ① Aluminized<br>② Silver Screen "25"<br>* Model 921-K-810<br>† Model 921-MT-805 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING: CAP. | VOLT | REPLACEMENT DATA: TRAV-LER PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1 | 140 | 200 | EC-54 | AFH31-37-25 | XA0266 | FP131 | TMH-34 | TVL-1540 | |
| C2 | 140 | 300 | EC-119 | AFH31-37-25 | XA0355 | FP131 | TMH-42 | TVL-1584 | |
| C3A | 400 | 300 | EC-130 | AFH34-100-25 | D044 | FP434.3 | TMQ-159 | TVL-4711 | |
| B | 60 | 300 | | | BR1005 | | | | |
| C | 100 | 50 | | | | | | | |
| C4 | 40 | 200 | EC-113 | PRH250 | BR4025 | TC58 | TD-40-350 | TVA-1511 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA: AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C5 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | 1.0 | 100V | | P388N-1.0 | | CUB2W1 | | GEM-21 | 2TM-M5 |
| C7 | 1000 | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP20 | 10TS-D10 |
| C8 | 820 | | Note 1 | DI-820 | DD-82 | BYA10T82 | CCD-82 | GP382 | 10TS-T82 |
| C9 | 820 | | | DI-820 | DD-82 | BYA10T82 | CCD-82 | GP382 | 10TS-T82 |
| C10 | 1.0 | 100V | | P388N-1.0 | | CUB2W1 | | GEM-21 | 2TM-M5 |
| C11 | 820 | | | DI-820 | DD-82 | BYA10T82 | CCD-82 | GP382 | 10TS-T82 |
| C12 | 2200 | | (1000mmf) † | BPD-022 | SS-222 | BYA10D22 | CCD-222 | GP322 | 5HK-D22 |
| C13 | 560 | | | DI-560 | DD-561 | L10T56 | CCD-561 | GP356 | 10TS-T56 |
| C14 | 1000 | 10% | | DI-1000 | DD-103 | PM6DL | CCD-102 | GP20 | 10TS-D10 |
| C15 | 5000 | | | BPD-005 | DD-502 | BYA10D5 | CCD-503 | GP250 | 5HK-D50 |
| C16 | .22 | 400V | | P488N-22 | | CUB4P22 | 4DP-5-224 | GEM-4022 | 4TM-P22 |
| C17 | .047 | 600V | | P688N-047 | DD-503 | CUB6S47 | 6DP-5-473 | GEM-6147 | 6TM-S47 |
| C18 | .022 | 600V | | P688N-022 | DD-203 | CUB6S22 | 6DP-5-223 | GEM-6122 | 6TM-S22 |
| C19 | .1 | 600V 10% | | V84C5P1-10% | | PM6DL | 6DP-4-104 | | 6TM-P1 |
| C20 | 1000 | 2000V | | HVD-30-1000 | DD30-103 | BYB20D1 | 3CCD-103 | 2HV-B10 | 30GA-D10 |
| C21 | 47 | 10% | | NPO-D1 47 | DTZ-47 | C10Q47C | CCTO-470 | CNO-447 | 10TCC-Q47 |
| C22 | 4.7 | 10% | | NPO-S1 4.7 | TCZ-4R7 | C10Y47C | CCTO-4R7 | CNO-547 | 10TCC-Y47 |
| C23 | 1000 | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-103 | GP20 | 10TS-D10 |
| C24 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C25 | 100 | N750 | | N750-D1 100 | DD-101 | CUT1U | CCTN-101 | CNT-310 | 10TU-T10 |
| C26 | 4700 | | | BPD-0047 | DD-473 | BYA10D47M | CCD-472 | GP247 | 5HK-D47 |
| C27 | 1000 | 10% | (1500mmf) † | DI-1000 | DD-103 | PM6DL | CCD-102 | GP20 | 10TS-D10 |
| C28 | .047 | 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-5-473 | GEM-4147 | 2TM-S47 |
| C29 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C30 | 1000 | 1400V | | DAC-27 | DDS-103 | BYB10S1 | 1SCD-103 | DAC-110 | BL-S10 |
| C31 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C32 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C33 | 150 | | | BPD-00015 | DD-151 | L10T15 | CCD-151 | GP315 | 10TS-T15 |
| C34 | 4700 | | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | GP247 | 5HK-D47 |
| C35 | 1000 | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP20 | 10TS-D10 |
| C36 | 1000 | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP20 | 10TS-D10 |
| C37 | 2200 | | | BPD-0022 | DD-222 | BYA10D22 | CCD-222 | GP222 | 5HK-D22 |
| C38 | 1000 | 2000V | | HVD-30-1000 | DD30-102 | BYB20D1 | 3CCD-102 | 2HV-B10 | BL-D10 |
| C39 | .033 | 600V | | P688N-033 | DD-303 | CUB6S33 | 6DP-5-333 | GEM-6133 | 6TM-S33 |
| C40 | 1000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C41 | .047 | 600V 10% | | V84C6S47-10% | | PM6DS7 | 6DP-3-473 | GEM-1615 | 6TM-S47 |
| C43 | .1 | 600V 10% | | V84C5P1-10% | | PM6DL | 6DP-4-104 | | 6TM-P1 |
| C45 | .047 | 600V | | P688N-047 | DD-503 | CUB6S47 | 6DP-5-473 | GEM-6147 | 6TM-S47 |
| C44 | .01 | 600V | | P688N-01 | DD-103 | CUB6S1 | 6DP-5-103 | GEM-611 | 6TM-S1 |
| C46 | .047 | | | BPD-0047 | DD-471 | BYA10D47M | CCD-473 | GP247 | 5HK-D47 |
| C47 | .047 | 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-5-473 | GEM-4147 | 2TM-S47 |
| C48 | 2900 | 10% | | 1464-0029 | | 1R5T29 | CM-20B-292K | MC1462.5 | MS-329 |
| C49 | 680 | 10% | | 1469-00068 | | 1R5T68 | CM-19B-681K | MC1249 | MS-368 |
| C50 | 680 | 10% | | 1469-00068 | | 1R5T68 | CM-19B-680K | MC1249 | MS-368 |
| C51 | 4700 | | | BPD-0047 | DD-472 | BYA10D47M | CCD-473 | GP247 | 5HK-D47 |
| C51 | .047 | 600V | | P688N-047 | DD-503 | CUB6S47 | 6DP-3-473 | GEM-6147 | 6TM-S47 |
| C52 | .1 | 1000V | | P1088N-1 | | CUB10P1 | | | 10TM-P1 |
| C53 | .047 | 1000V | | P1088N-047 | | CUB10S47 | 16DP-5-473 | GEM-10147 | 10TM-S47 |
| C54 | 68 | 2000V 10% | | | | HVA20Q68 | VCM-20-680K | 2DY-468 | |
| C55 | 1000 | 2000V | (1000②1000V) † | HVD-30-1000 | DD30-103 | BYB20D1 | 3CCD-103 | 2HV-B10 | BL-D10 |
| C56 | 1000 | 2000V | | HVD-30-1000 | DD30-103 | BYB20D1 | 3CCD-102 | 2HV-B10 | BL-D10 |
| C57 | 1500 | | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C58 | 5000 | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C59 | 1500 | | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C60 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-5-503 | GEM-4115 | 4TM-S5 |

Note 1. May not be used in some versions. † Alternate



## CONTROLS

| ITEM No. | RATING: RESISTANCE | WATTS | REPLACEMENT DATA: TRAV-LER PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | VC-130 | | | B13-133 | PP55A | Volume |
| B | Switch | | | | | SK7 | Not Req. | Push-Pull Off-On |
| R2A | 1000Ω | ½ | VC-195 | F1-5 | | † Ⓒ 1129 | ■ Ⓤ E4067 | Contrast |
| B | 5000Ω | ½ | | R2-19 | | | | Vert. Linearity |
| R3A | 200K | ½ | VC-194 | F1-33 | | ♦ Ⓒ 1130 | ▲ Ⓤ E4121 | Vert. Hold |
| B | 2.5meg | ½ | | R3-76 | | | | Vert. Size (Height) |
| R4A | 100K | ½ | VC-109 | B-40 | A47-100K-S | Q11-128 | TA15L | Brightness |
| B | Shaft | | Not Req. | K88-3 | Not Req. | Not Req. | Not Req. | |
| R5A | 100K | ½ | VC-84 | EX-40 | B47-100K-S | B11-128 | PTA15L | AGC |
| B | Shaft | | Not Req. | Not Req. | TM4 | Not Req. | Not Req. | |

† "Concentrikit" Equivalent: K-15 Kit with Base Elements and Shafts: B17-108, P17-028 (Panel) B11-114, R15-005 (Rear)

♦ "Concentrikit" Equivalent: K-15 Kit with Base Elements and Shafts: B11-139, P17-028 (Panel) (Not available as a factory assembled unit.) B11-239, R15-005 (Rear)

■ "STA-LOC" Equivalent: FA13R, RU53L, C587SA, 19437.

▲ "STA-LOC" Equivalent: FA28L, RU28SL, C587SA, 19437.

## RESISTORS

**All wattages 1/2 watt, or less, unless otherwise listed.**

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R6 | 3meg | |
| R7 | 10meg | |
| R8 | 2.2meg | |
| R9 | 1000Ω | |
| R10 | 4700Ω | |
| R11 | 470Ω | |
| R12 | 47Ω | |
| R13 | 150K | |
| R14 | 5600Ω 1W | |
| R15 | 220Ω | |
| R16 | 6800Ω | |
| R17 | 47K | |
| R18 | 390K | |
| R19 | 100Ω | |
| R20 | 7500Ω 5W | #WR-46 |
| R21 | 1200Ω | |
| R22 | 47Ω | |
| R23 | 180Ω | |
| R24 | 15K | |
| R25 | 82K | |
| R26 | 470K | |
| R27 | 150K | |
| R28 | 39K | |
| R29 | 39K | |
| R30 | 220K | |
| R31 | 8200Ω 1W | |
| R32 | 100K | |
| R33 | 100K | |
| R34 | 330Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R35 | 100K | |
| R36 | 8200Ω | |
| R37 | 680Ω | |
| R38 | 330K | |
| R39 | 1meg | |
| R40 | 1meg | |
| R41 | 150Ω | |
| R42 | 2200Ω 1W | |
| R43 | 270K | |
| R44 | 4.7meg | |
| R45 | 47K | |
| R46 | 56K | |
| R47 | 4.7meg | |
| R48 | 2.2meg | |
| R49 | 3300Ω | |
| R50 | 220K | |
| R51 | 820K | |
| R52 | 150K | |
| R53 | 2.2meg | |
| R54 | 100K | |
| R55 | 390Ω 1W | |
| R56 | 68Ω 1W | ① |
| R57 | 15K | |
| R58 | 39K 1W | |
| R59 | 1200Ω | |
| R60 | 560Ω | |
| R61 | 560Ω | |
| R62 | 39K | |
| R63 | 6800Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R64 | 2200Ω | |
| R65 | 5600Ω | |
| R66 | 100K | |
| R67 | 100K | |
| R68 | 4.7meg | |
| R69 | 22K 2W | |
| R70 | 470K | |
| R71 | 9100Ω | |
| R72 | 1500Ω | |
| R73 | 68K | |
| R74 | 15K | |
| R75 | 100K | |
| R76 | 470K | |
| R77 | 100Ω | |
| R78 | 22K 2W | |
| R79 | 33Ω 2W | |
| R80 | 4700Ω 2W | |
| R81 | 1.2Ω | |
| R82 | | #F-9 |
| R83 | 2.2Ω 5W | ② |
| R84 | 2.2Ω 5W | ③ |
| R85 | 5.5Ω | #F-6-1 ③ |
| R86 | 27Ω 10W | #WR-26 |
| R87 | 470K | |
| R88 | 3300Ω | ① |
| R89 | 560K | |
| R90 | 27Ω 10W | #WR-26 |

# Trav-ler Part Number.
① May not be used in some versions. ③ Fusible Type.
② Some versions may use a 5Ω 10W single resistor for R83 and R84 (Part #WR-5).

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA: TRAV-LER PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | 1st Video IF | L-150 | | | | | | |
| L3A | 2nd Video IF | L-153 | 17-5003 | 17-5003 | TV-127 | 6232 | | |
| B | 41.25MC Trap | | | | | | | |
| L3 | 3rd Video IF | L-153 | | | | | | |
| L4 | RF Choke | L-160 | 19-1005 | 19-1005 | BC-566 | 4612 | 10uh | |
| L5 | RF Choke | L-158 | | | | 4615 | 27uh | |
| L6A | 4.5MC Trap | L-154 | | | | | | |
| B | 1st Sound IF | | | | | | | |
| L7 | Series Peaking Coil | L-162 | | | | | ① | |
| L8 | Shunt Peaking Coil | L-163 | | | | | ① | |
| L9 | 2nd Sound IF | L-167 | | | | | | |
| L10 | Quadrature Coil | L-110A | 17-1031 * | 17-1031 * | | 1481 * | SD-5 * | |

① Wound on 4700Ω Resistor. ② Wound on 10K Resistor. * Parallel with 100K Resistor.

## TRANSFORMER (HORIZ. OSC.)

| ITEM No. | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Miller PART No. | Ram PART No. | Thordarson PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| L11 | 97Ω | | L-156 | H3-5 * | TV-163 * | 6210 * | H-102 * | H3-5 * | Horiz. Stabilizer<br>* Enlarge mounting hole. |

## FILTER CHOKE

| ITEM No. | RATINGS: CURRENT | DC RES. | INDUCTANCE @ CURRENT 1000 (%) | REPLACEMENT DATA: TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L12 | .230A | 48.5Ω | .85 Hy. | FC-5A | | | | C-2343 | | C-24X |

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA: TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Rogers PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | Vert. Ouput | TR-26C | 26S53 | A-2823 | V307 | V30F19/45 | V034 | A-8143 | [redacted] Y-16 ①② | A-102X |
| T2 | Yoke-Horiz.(21MH) (90°)-Vert. (19MH) | L-118C | | MDF-92 ①③ | Y90F19 ①③ | | PCM2045 ①③ | DY-18A ①③ | | Y-41 & NW-3 & YC-113③ |
| | Rear Cover and Centering Device | MP-147 | | | | | | | | |
| T3 | Yoke Clamp<br>Horiz. Output | ST-35<br>TR-53A | FLY-76 * | HVD-54 * | X129 * | EFR172 * | A-8255 * | FLY-76 * | D-181R * | |

① Requires new rear cover, centering device, and yoke clamping device.
② Connect horizontal yoke damping capacitor across yoke terminals #2 and #1.

## *HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

| ORIGINAL TERMINAL CONNECTIONS | Halldorson Replacement Connections | Merit Replacement Connections | Ram Replacement Connections | Rogers Replacement Connections | Stancor Replacement Connections | Thordarson Replacement Connections | Triad Replacement Connections |
|---|---|---|---|---|---|---|---|
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4 | 4 | 4 | 4 | 4 | 4 | 6 | |
| 6 | N.C. See Note ② | N.C. See Note ③ | N.C. See Note ① | N.C. See Note ③ | N.C. See Note ③ | N.C. See Note ③ | 3 |
| 7 | 2 | 2 | 2 | 2 | 2 | 2 | 7 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| 2 | 7 | 7 | 7 | 7 | 7 | 7 | 2 |
| 1 | 8 | 8 | 8 | 8 | 8 | 8 | 1 |
| Special Notes → | ④ | ④ | ④ | ④ | ⑤ | ④ | |

② Remove R80, Capacitor C54, and yoke center tap lead from circuit. Requires new damping network consisting of 150Ω, ½ watt Resistor and 82mmf ② 2KV Capacitor connected in series. Install damping network across horizontal yoke terminals #3 & #7.
④ Remove one turn from filament winding.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA: TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T4 | 2800Ω | 3-4Ω | AT-52 | 24S53 | A-3025 | AU-506 | A-3332 | [redacted] | S-12X | |

## SPEAKER

| ITEM No. | TYPE: SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA: TRAV-LER PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 5" | PM | 3-4Ω | SPK-36 | 5A07 | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | TRAV-LER PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Vert. Integrator | 4700mmf, 10000mmf, 15K, 15K | CC-120 | |

## RECTIFIERS

| ITEM No. | RATING: CURRENT (Measured) | REPLACEMENT DATA: TRAV-LER PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .230A | SR-14 * | 5E4 * | HA504 * | 40K * | SR500 * | * Silicon Type |
| M2 | .230A | SR-14 * | 5E4 * | HA504 * | 40K * | SR500 * | * Dual Selenium Diode |
| M3 | | SR-15 * | 5D-91 * ① | K1615 * | | | ① Two required |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA: TRAV-LER PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|
| M4 | 1N87 | SC-23 | 1N87 | 1N90 | 1N87 | Video Det. (Pigtail) |

## MISCELLANEOUS

| ITEM No. | PART NAME | TRAV-LER PART No. | NOTES |
|---|---|---|---|
| M5 | Tuner | TA-50 | VHF, Model 921-K-810M, B, Chassis 1150-29 |
| | Tuner | TA-55 | VHF, Model 921-MT-805M, B, Chassis 1155-29 |

TRAV-LER MODELS 921-K-810B, M, 921-MT-805B, M (Ch. 1150-29, 1155-29)

FOLDER 1

# PARTS LIST AND DESCRIPTIONS (Continued)

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Safety Glass | DW-46T | Model 921-K-810 |
| | DW-54T | Alternate, Model 210-K-810 |
| Safety Glass | DW-89T | Model 921-MT-805 |
| Mask | MP-148 | Model 921-K-810 |
| Mask | MP-113 | Model 921-MT-805 |
| Knob | K-358 | Channel Selector, Model 921-K-810 |
| Knob | K-284 | Channel Selector, Model 921-MT-805 |
| Knob | K-357 | Fine Tuning, Model 921-K-810 |
| Knob | K-283 | Fine Tuning, Model 921-MT-805 |
| Knob | K-353 | Off-On, Volume, Brightness, All Models |
| Knob | K-352 | Contrast, Vertical Hold, All Models |
| Cabinet Leg | CH-110 | Model 921-K-810 |

## WIRING DATA

| | | |
|---|---|---|
| High Voltage Lead | Use BELDEN No. | 8869 |
| Shielded Hook-up Wire | Use BELDEN No. | 8885 (Single Conductor) |
| | | 8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. | 8530 (Solid) Available in Ten Colors |
| | | 8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. | 8874 |
| 300Ω Tuner Input Lead | Use BELDEN No. | 8225 |
| 300Ω Antenna Lead-in | Use BELDEN No. | 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. | 8464 (Flat) or 8484 (Round) - 4 Conductor |
| | | 8485 (Round) - 5 Conductor |
| | | 8488 (Round) - 8 Conductor |

# TUNER PARTS LIST AND DESCRIPTIONS

## TA—50

### TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V201 | RF Amplifier | 2BN4 | V202 | Mixer - Osc. | 5CG8 |

### FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C201 | 120 N220 10% | #13L-031 | | | | * | | 10TCR-T12 |
| C202 | 30 | #13M350U300N-02 | | | | | | |
| C203A | 15 N150 7% | #13L8PG150N2 | | | | * | | 10TCP-Q15 |
| B | 15 N150 7% | | | | | * | | 10TCP-Q15 |
| C204 | 800 | | EF-001 | MFT-1000 | | CCF-102 | | |
| C205 | 2-6 | | | 829-6 | | VC-3 | CT552 | |
| C206 | 47 | | EF-000050 | MFT-50 | | | | |
| C207 | .3 | | | | | | | |
| C208 | 2-6 | | | 829-6 | | VC-3 | CT552 | |
| C209 | 1 | | NPO-SI 1.0 | TCZ-1 | | | CNO-510 | 10TCC-V10 |
| C210 | 51 N750 10% | | N750-DI 47 | TCN-51 | C10Q51U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C211 | 2-6 | | | 829-6 | | VC-3 | CT552 | |
| C212 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 10TS-D10 |
| C213 | 30 | #13M350U300N-02 | | | | | | |
| C214 | 13 N220 5% | #13L8R130J | | | | * | | |
| C215 | 4.7 N220 ±25mmf | #13L8R4R7C | | | | * | | |
| C216 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 10TS-D10 |
| C217 | 800 | | EF-001 | MFT-100 | | CCF-102 | CT280A | |
| C218 | 800 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C219 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 10TS-D10 |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# STANDARD COIL Part Numbers.

### RESISTORS

**All wattages 1/2 watt, or less, unless otherwise listed.**

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R201 | 4700Ω | |
| R202 | 470Ω ① | |
| R203 | 100K | |

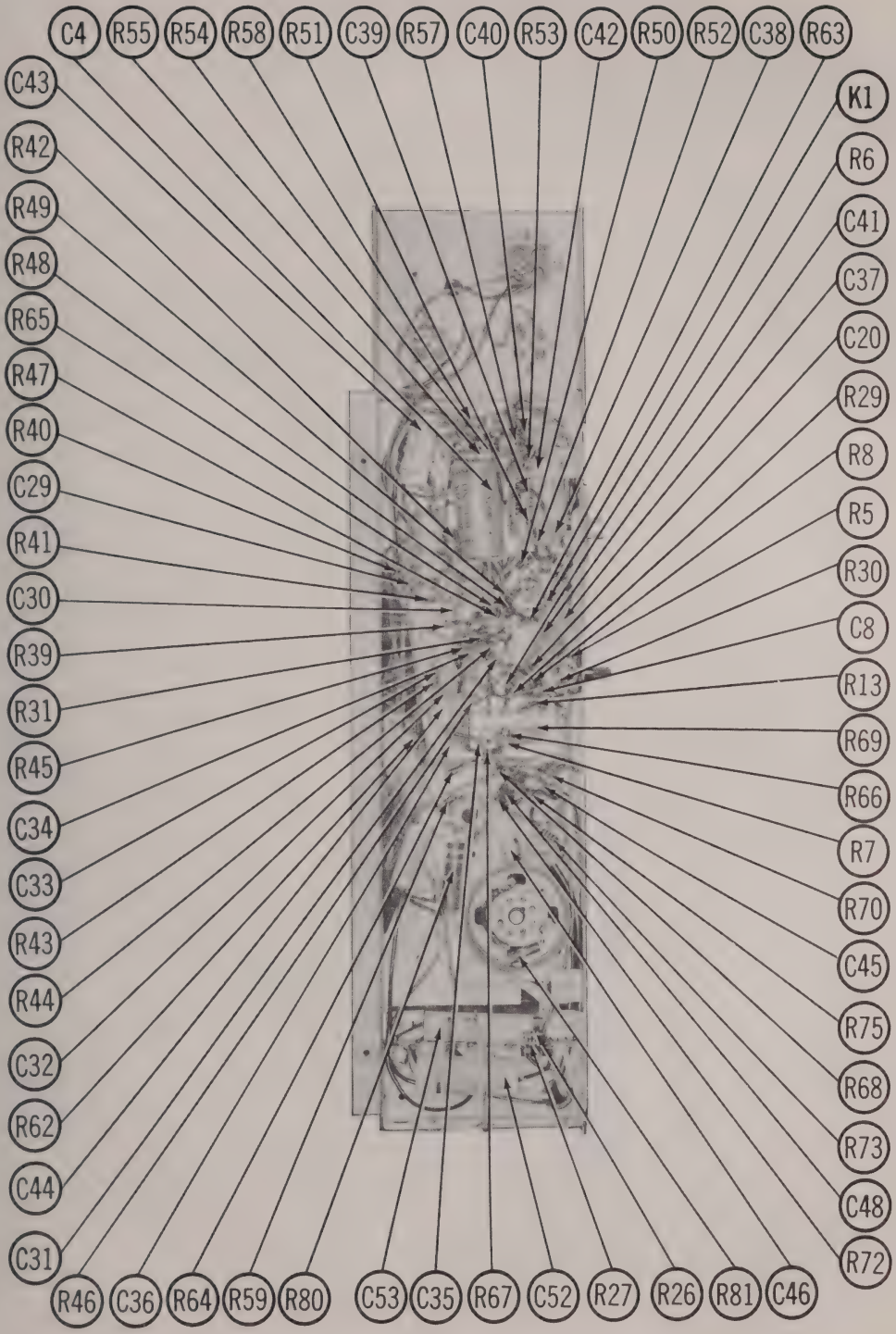
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R204 | 220K | |
| R205 | 10K | |
| R206 | 1000Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R207 | 5600Ω | |
| R208 | 10K | |

① Some versions may use 1000Ω in this application.

### COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | TRAV-LER PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K201 | Antenna Isolation | 470mmf, .3-1meg | | Centralab RC-471<br>Sprague AC1-1 |
| K202 | Antenna Isolation | 470mmf, .3-1meg | | Centralab RC-471<br>Sprague AC1-1 |




LOWER CHASSIS - BOTTOM VIEW

# TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO # 2531
A213 thru A215 ... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC | 211.25MC<br>215.75MC | 13 | Vert. Amp. thru 47K across Video Det. load. | A201 | Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%. |
| | | | 207MC | 205.25MC<br>209.75MC | 12 | | A202 | |
| | | | 201MC | 199.25MC<br>203.75MC | 11 | | A203 | |
| | | | 195MC | 193.25MC<br>197.75MC | 10 | | A204 | |
| | | | 189MC | 187.25MC<br>191.75MC | 9 | | A205 | |
| | | | 183MC | 181.25MC<br>185.75MC | 8 | | A206 | |
| | | | 177MC | 175.25MC<br>179.75MC | 7 | | A207 | |
| | | | 85MC | 83.25MC<br>87.75MC | 6 | | A208 | |
| | | | 79MC | 77.25MC<br>81.75MC | 5 | | A209 | |
| | | | 69MC | 67.25MC<br>71.75MC | 4 | | A210 | |
| | | | 63MC | 61.25MC<br>65.75MC | 3 | | A211 | |
| | | | 57MC | 55.25MC<br>59.75MC | 2 | | A212 | |

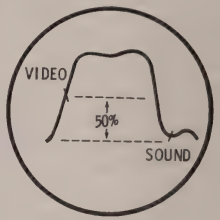


FIG.201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 2. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 195MC | 193.25MC<br>197.75MC | 10 | Vert. Amp. thru 10K to point (T). Low side to chassis. | A213,<br>A214,<br>A215 | Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope. Reduce bias. |
| 3. | " | " | 213MC | 211.25MC<br>215.75MC | 13 | " | A216 | Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns. |
| | | | 207MC | 205.25MC<br>209.75MC | 12 | | A217 | |
| | | | 201MC | 199.25MC<br>203.75MC | 11 | | A218 | |
| | | | 195MC | 193.25MC<br>197.75MC | 10 | | A219 | |
| | | | 189MC | 187.25MC<br>191.75MC | 9 | | A220 | |
| | | | 183MC | 181.25MC<br>185.75MC | 8 | | A221 | |
| | | | 177MC | 175.25MC<br>179.75MC | 7 | | A222 | |
| | | | 85MC | 83.25MC<br>87.75MC | 6 | | A223 | |
| | | | 79MC | 77.25MC<br>81.75MC | 5 | | A224 | |
| | | | 69MC | 67.25MC<br>71.75MC | 4 | | A225 | |
| | | | 63MC | 61.25MC<br>65.75MC | 3 | | A226 | |
| | | | 57MC | 55.25MC<br>59.75MC | 2 | | A227 | |

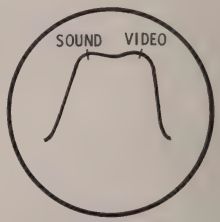
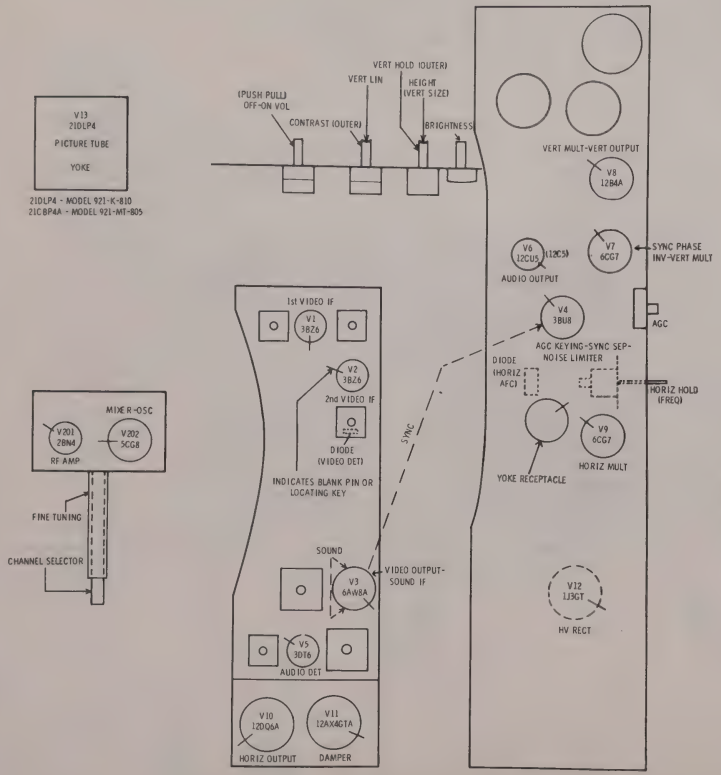


FIG.202

VHF TUNER TA50

## TUBE PLACEMENT CHART



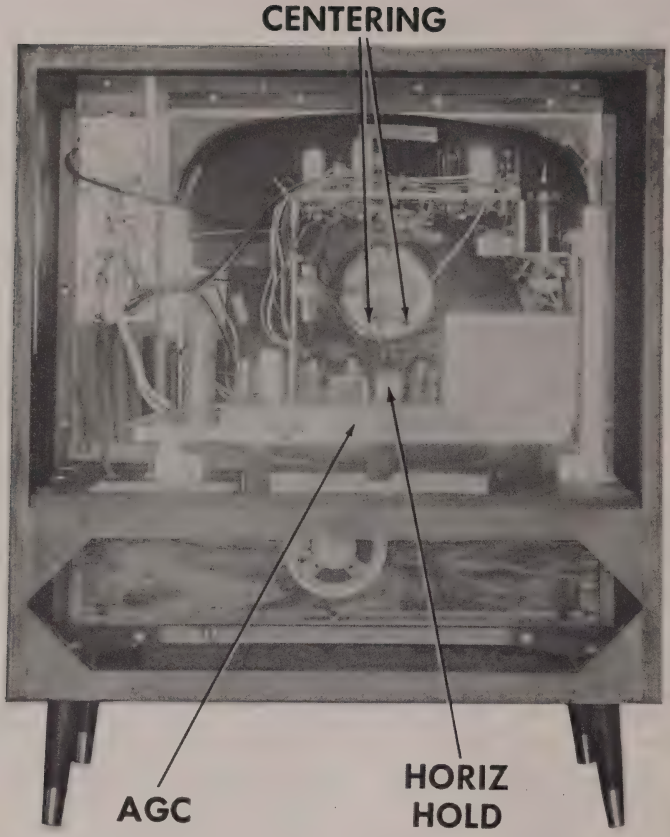

## BOTTOM VIEW

## RESISTANCE MEASUREMENTS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 3BZ6 | 150K | 47Ω | 7.5Ω | 6.8Ω | ▪3800Ω | ▪470Ω | 0Ω | | |
| V2 | 3BZ6 | .2Ω | 220Ω | 6.8Ω | 6Ω | †5600Ω | †5600Ω | 0Ω | | |
| V3 | 6AW8A | 0Ω | 100K | ▪100K | 4.8Ω | 6Ω | •80Ω | 6900Ω | ▪1200Ω | †7500Ω |
| V4 | 3BU8 | ▪0Ω | †8200Ω | 2.3meg | 42.5Ω | 42Ω | †40K | †390K | †45K | ▪4.7meg |
| V5 | 3DT6 | 19Ω | 680Ω | 4.8Ω | 4Ω | †330K | ▪8200Ω | 560K | | |
| V6 | 12C5<br>12CU5 | ¶ | 600K | 42Ω | 38.5Ω | 600K | †220Ω | †425Ω | | |
| V7 | 6CG7 | †•2.5meg | 220K | •200K | 36.5Ω | 38.5Ω | †12K | 1.6meg | 3300Ω | 0Ω |
| V8 | 12B4A | •1100Ω | 2.2meg | 36.5Ω | 35Ω | 35Ω | NC | 2.2meg | NC | †320Ω |
| V9 | 6CG7 | †9200Ω | 2.2meg | 1500Ω | 42.5Ω | 44Ω | †100K | 68K | 1500Ω | 0Ω |
| V10 | 12DQ6A | NC | 44Ω | NC | †22K | 470K | TP | 47Ω | 33Ω | TOP CAP<br>†16Ω |
| V11 | 12AX4GTA | NC | NC | ¶700K | NC | †0Ω | NC | 74Ω | 77Ω | |
| V12 | 1J3GT | PINS 1 THRU 8 HAVE INFINITE RESISTANCE | | | | | | | | TOP CAP<br>†456Ω |
| V13 | 21DLP4 | 4Ω | 39K | Pin 6<br>†150K | Pin 10<br>†150K | Pin 11<br>•100K | Pin 12<br>2.5Ω | | | |
| V201 | 2BN4 | 0Ω | 3.2meg | .8Ω | 0Ω | ▪1300Ω | 0Ω | 3.2meg | | |
| V202 | 5CG8 | 10K | ▪5900Ω | 0Ω | 2.5Ω | .8Ω | ▪1300Ω | ▪10K | 0Ω | 230K |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE.
▪ MEASURED FROM 140V SOURCE.
‡ MEASURED FROM PIN 3 OF V11.

NC NO CONNECTION
TP TIE POINT




CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast Controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

PHOTOFACT® Folder

**ZENITH CHASSIS 16E27,
U, Q, S-48434**

## IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ZENITH CHASSIS 16E27,
U, Q, S-48434

MODEL E2460M (CH. 16E27)

ZENITH CHASSIS 16E27,
U, Q, S-48434

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**ZENITH CHASSIS 16E27, U, Q, S-48434**

ZENITH CHASSIS 16E27, U, Q, S-48434

# DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL E2460

1. Remove 8 push-on type knobs in front.
2. Remove 8 wood screws holding rear cover. Remove rear cover.
3. To remove tuner, remove 2 screws at top of cabinet holding tuner mounting bracket.
   Note: If tuner removal is not necessary, unplug leads at tuner (connecting to main TV chassis).
4. Remove 2 screws holding on-off switch mounting bracket.
5. Remove 4 chassis bolts under cabinet and remove speaker leads.
6. Pull chassis straight out.

PICTURE TUBE REMOVAL

1. Follow steps 1 thru 6 of "Chassis Removal".
2. Remove yoke, picture tube socket and high voltage lead.
3. Loosen mounting strap and yoke screw.
4. Pull picture tube straight out.

MODEL E2460M (CH. 16E27)

| TRADE NAME | Zenith | MODELS | CHASSIS |
|---|---|---|---|
| | | E2458E, E2458R, E2458W, E2460M, E2460R | 16E27 |
| | | E2458EU, E2458RU, E2458WU, E2460MU, E2460RU | 16E27U |
| | | E3012H, E3012R, E3013H, E3014W, E3015L | 16E27Q |
| | | Remote Control Receiver | S-48434 |
| MANUFACTURER | Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois | | |
| TYPE SET | Television Receiver (Models Using 16E27Q Chassis with Remote Control) | | |
| TUBES | VHF - Sixteen, UHF - Seventeen, Remote Control Receiver - Eight | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycle | | |
| RATING | 200 Watts, 108 Amp. @ 117 Volts AC (VHF, Less Remote Control) | | |
| TUNING RANGE | Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) | | |

# SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Follow steps 1 thru 6 of "Chassis Removal". Remove 8 screws holding mask. Tilt safety glass and remove.

FUSE

TV: A 5 Amp. Line Fuse is used for receiver protection and a .7 Amp. Fuse is used for low voltage supply protection. (For location, see "Tube Placement Chart".)
A Fuse wire is used for filament protection. (For location, see M4 in Photo "Chassis - Bottom View".)
Remote Control Receiver: A 3/4 Amp. Fuse is used for low voltage supply protection.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the magnets so that all sides are straight.

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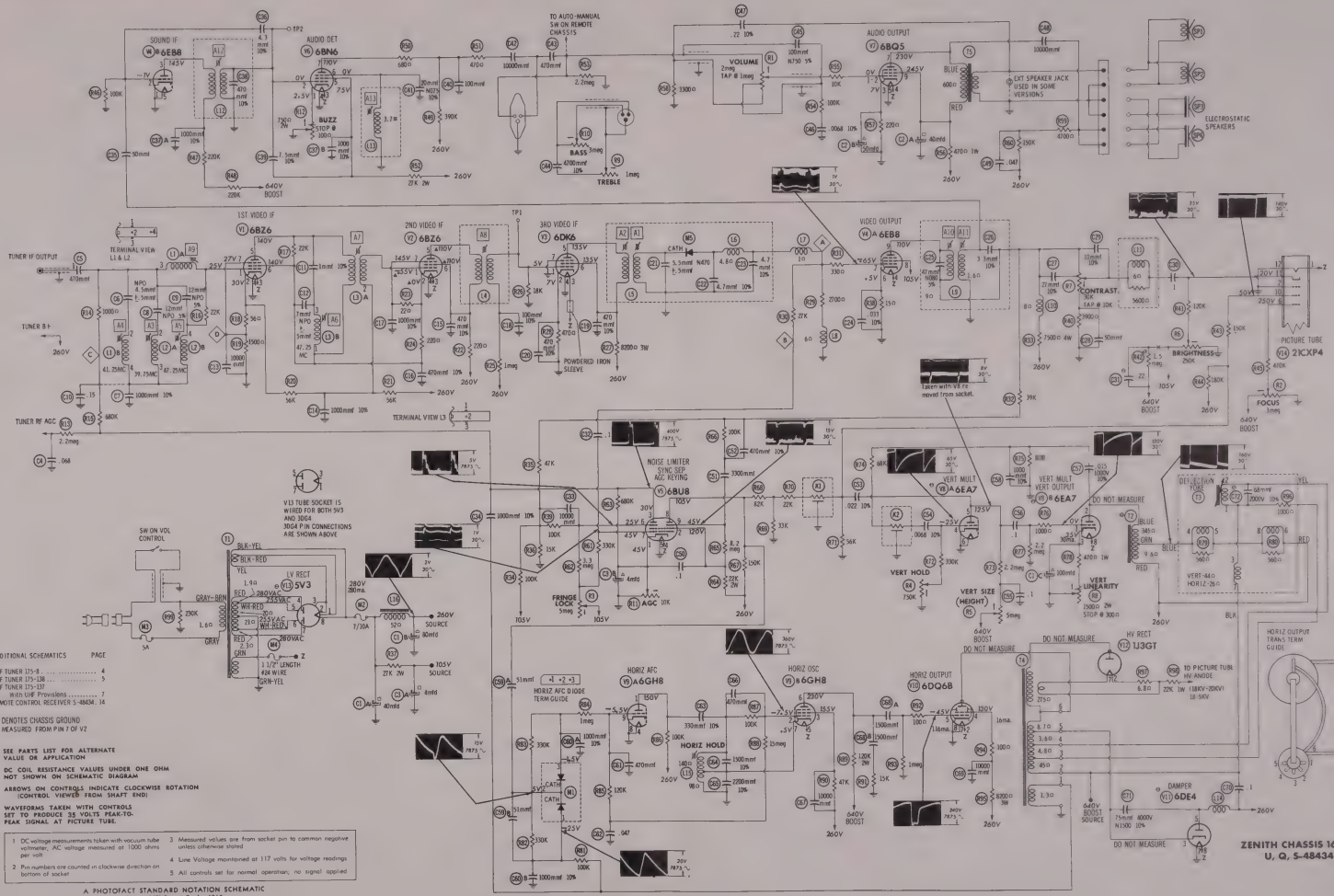
KA109



SET492 FOLDER 2


ZENITH CHASSIS 16E27, U, Q, S-48434
SOUND IF
AUDIO DET
AUDIO OUTPUT
VOLUME
BUZZ
BASS
TREBLE
TO AUTO-MANUAL SW ON REMOTE CHASSIS
EXT SPEAKER JACK USED IN SOME VERSIONS
ELECTROSTATIC SPEAKERS
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO OUTPUT
TUNER IF OUTPUT
TERMINAL VIEW L1 & L2
TUNER B+
TUNER RF AGC
TERMINAL VIEW L3
CONTRAST
BRIGHTNESS
PICTURE TUBE
FOCUS
V13 TUBE SOCKET IS WIRED FOR BOTH 5V3 AND 30G4 3004 PIN CONNECTIONS ARE SHOWN ABOVE
SW ON VOL CONTROL
LV RECT
NOISE LIMITER SYNC SEP AGC KEYING
FRINGE LOCK
AGC
VERT MULT
VERT OUTPUT
VERT HOLD
VERT SIZE (HEIGHT)
VERT LINEARITY
DO NOT MEASURE
DEFLECTION YOKE
VERT-440 HORIZ-260
HORIZ AFC
HORIZ AFC DIODE TERM GUIDE
HORIZ OSC
HORIZ HOLD
HORIZ OUTPUT
HV RECT
1J3GT
TO PICTURE TUBE HV ANODE
HORIZ OUTPUT TRANS TERM GUIDE
DAMPER
ADDITIONAL SCHEMATICS PAGE
UHF TUNER 175-8 ... 4
VHF TUNER 175-138 ... 5
VHF TUNER 175-137 With UHF Provisions ... 7
REMOTE CONTROL RECEIVER S-48434 ... 14
⏚ DENOTES CHASSIS GROUND
▲ MEASURED FROM PIN 7 OF V2
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 35 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation; no signal applied
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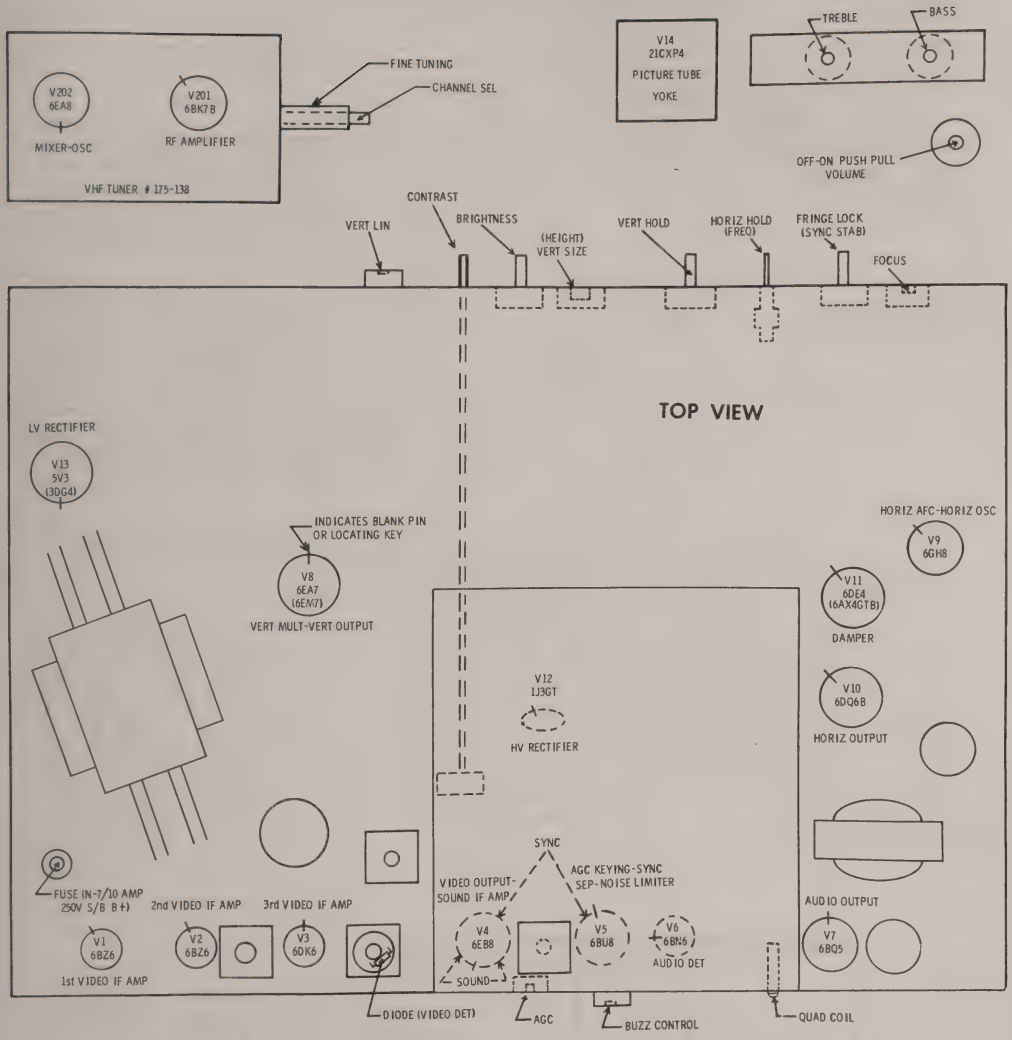
ZENITH CHASSIS 16E27, U, Q, S-48434

# TUBE PLACEMENT CHART




# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (Line), V13, Fuse (B+), Fuse (Fil.)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V8
Horiz. off freq. Diodes (Horiz. Phase Det.), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V8
No horiz. sync Diodes (Horiz. Phase Det.), V5, V9
No vert. or horiz. sync V5

# ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A13 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

| | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | High side thru 470mmf to TP-1. Low side to chassis. Connect a 56Ω carbon resistor across sweep output. | 44MC (10MC Swp.) | 39.75MC<br>41.25MC<br>45.75MC | Between any two channels. | Vert. Amp. thru 10K to point (A). Low side to chassis. (Across Video Det. load.) | A1, A2, | Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, check to see that the cores are entering their respective windings from opposite ends of the coils. |
| 2. | High side to ungrounded tube shield floating over Mixer-Osc. Low side to chassis. | " | 39.75MC<br>41.25MC<br>47.25MC | " | " | A3, A4, A5, A6 | Connect a clip lead from point (B) to chassis. Connect a clip lead from point (C) to point (D). Use high scope gain and adjust A3 thru A6 for MINIMUM marker amplitudes as in Fig. 2. A3 controls 39.75MC marker, A4 controls 41.25MC marker, and A5 and A6 control the 47.25MC marker. |
| 3. | " | " | 41.25MC<br>42.75MC<br>45.0MC<br>45.75MC | " | " | A7, A8, A9 and Mixer Plate Coil | Remove clip lead from point (D) and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A7 affects low side of curve and A8 affects the high side. Remove clip lead. |

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the Audio Detector as evidenced by a hiss similar to super-regeneration in the sound. Adjust A10, A11, A12 and A13 for maximum sound of best quality. Adjust the Buzz Control for MINIMUM buzz.
If the hiss disappears during alignment, further reduce the signal level until the hiss returns.

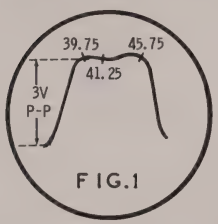


FIG.1

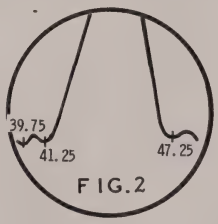


FIG.2

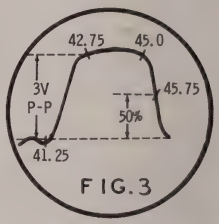
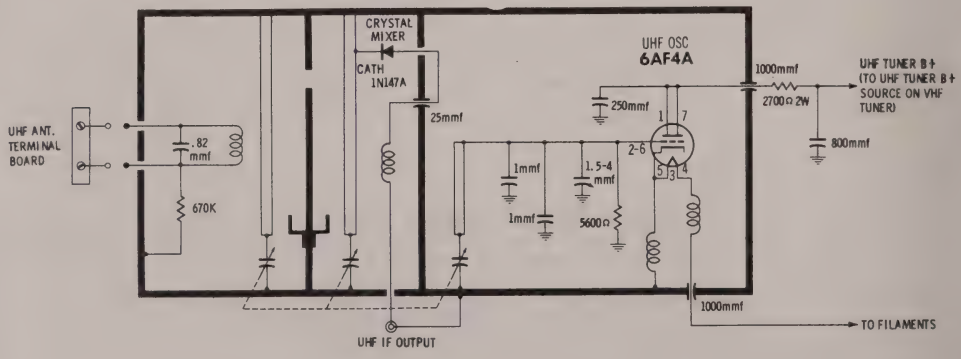


FIG.3

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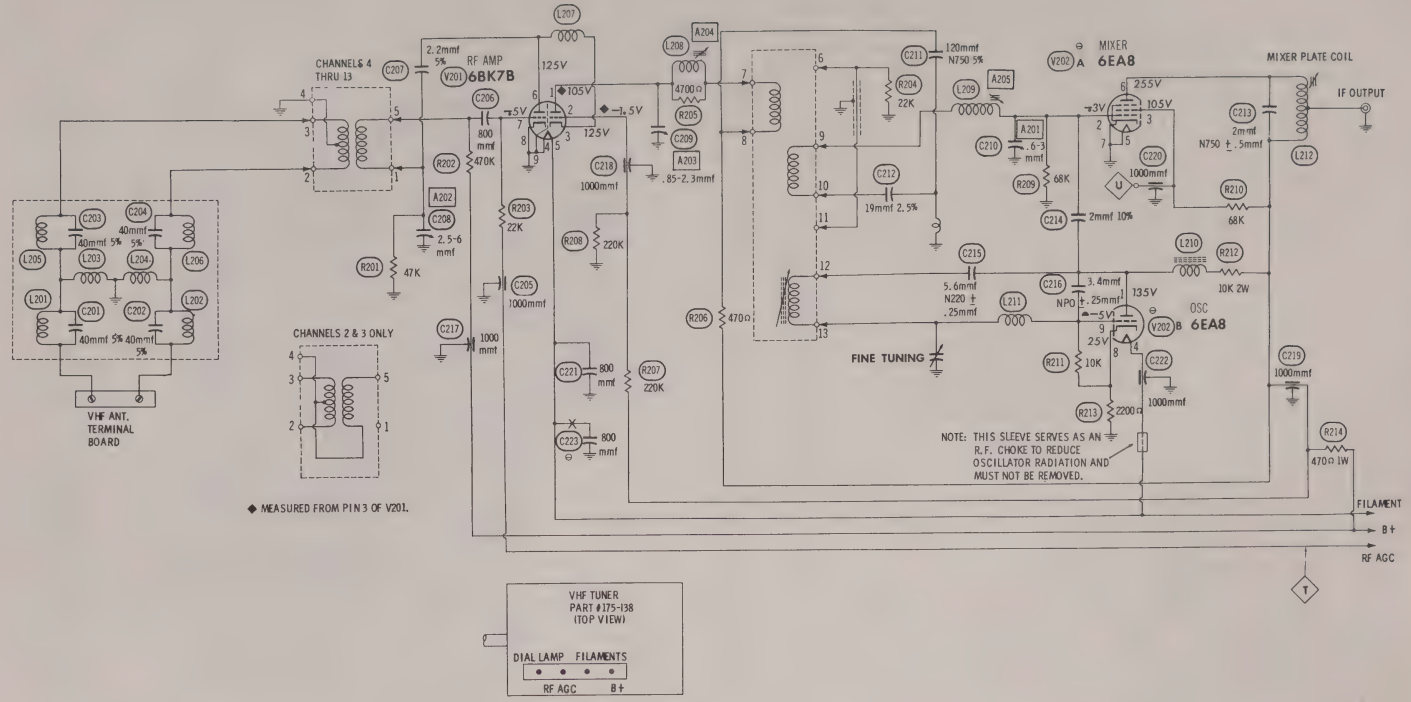
UHF TUNER 175-8

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VHF TUNER 175-138

ZENITH CHASSIS
16E27, U, Q, S-48434

# TUNER ALIGNMENT INSTRUCTIONS
## 175-137, -138

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Individual channel adjustment screws are accessible one at a time, thru a hole in the back of the tuner, as the channel selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | 50-300Ω Matching Trans. | Across VHF antenna terminals thru matching transformer. | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | Vert. Amp. thru 10K to point Ⓤ. Low side to chassis. | A201, A202, A203 | Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. |
| 2. | " | " | 201MC (10MC Swp) | 199.25MC 203.75MC | " | " | A204, A205 | Adjust for maximum gain and symmetry of response similar to Fig. 201. with markers as shown. Repeat steps 1 and 2 until best overall symmetry is obtained. |

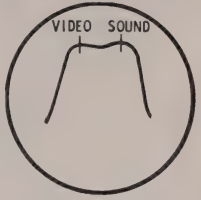
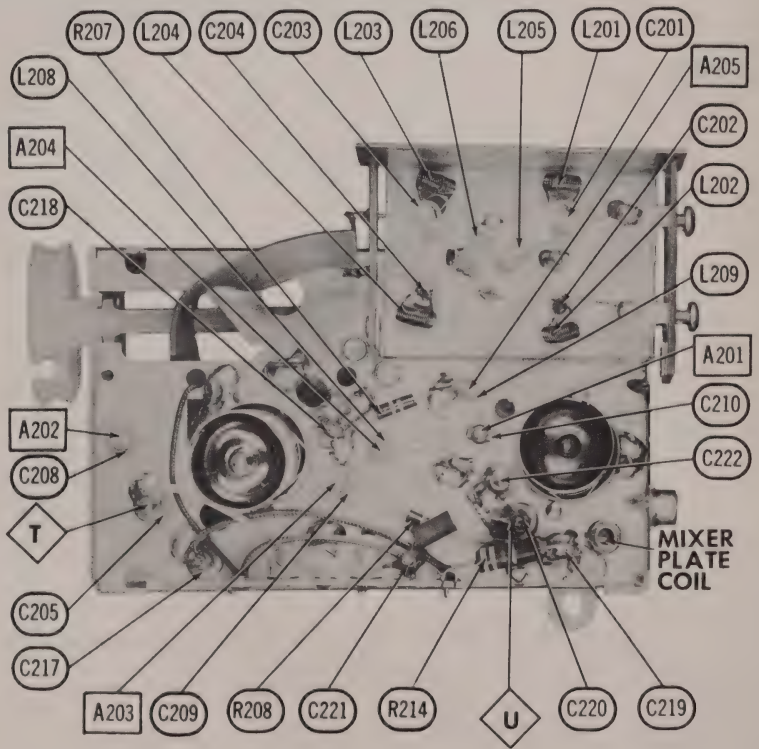
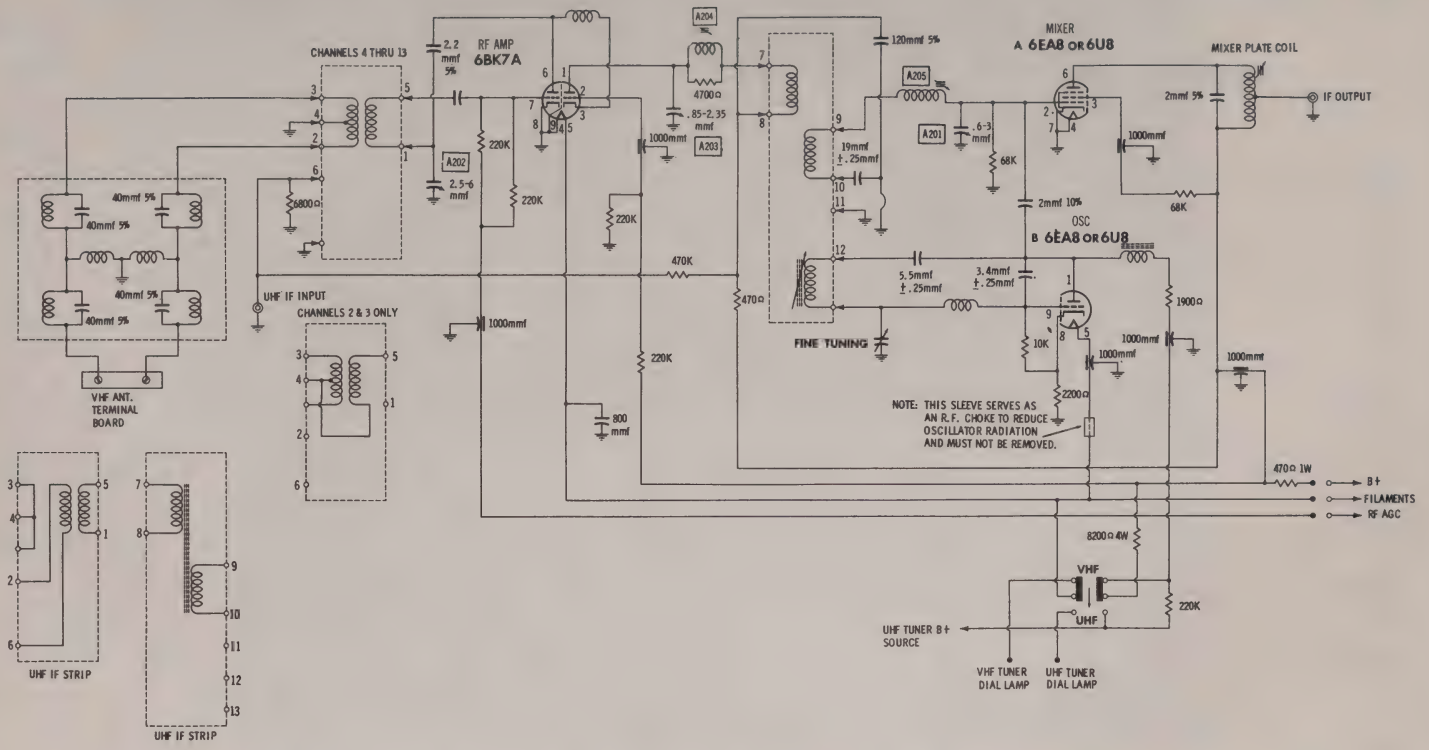



FIG. 201




VHF TUNER 175-138 - TOP VIEW




A PHOTOFACT STANDARD NOTATION SCHEMATIC

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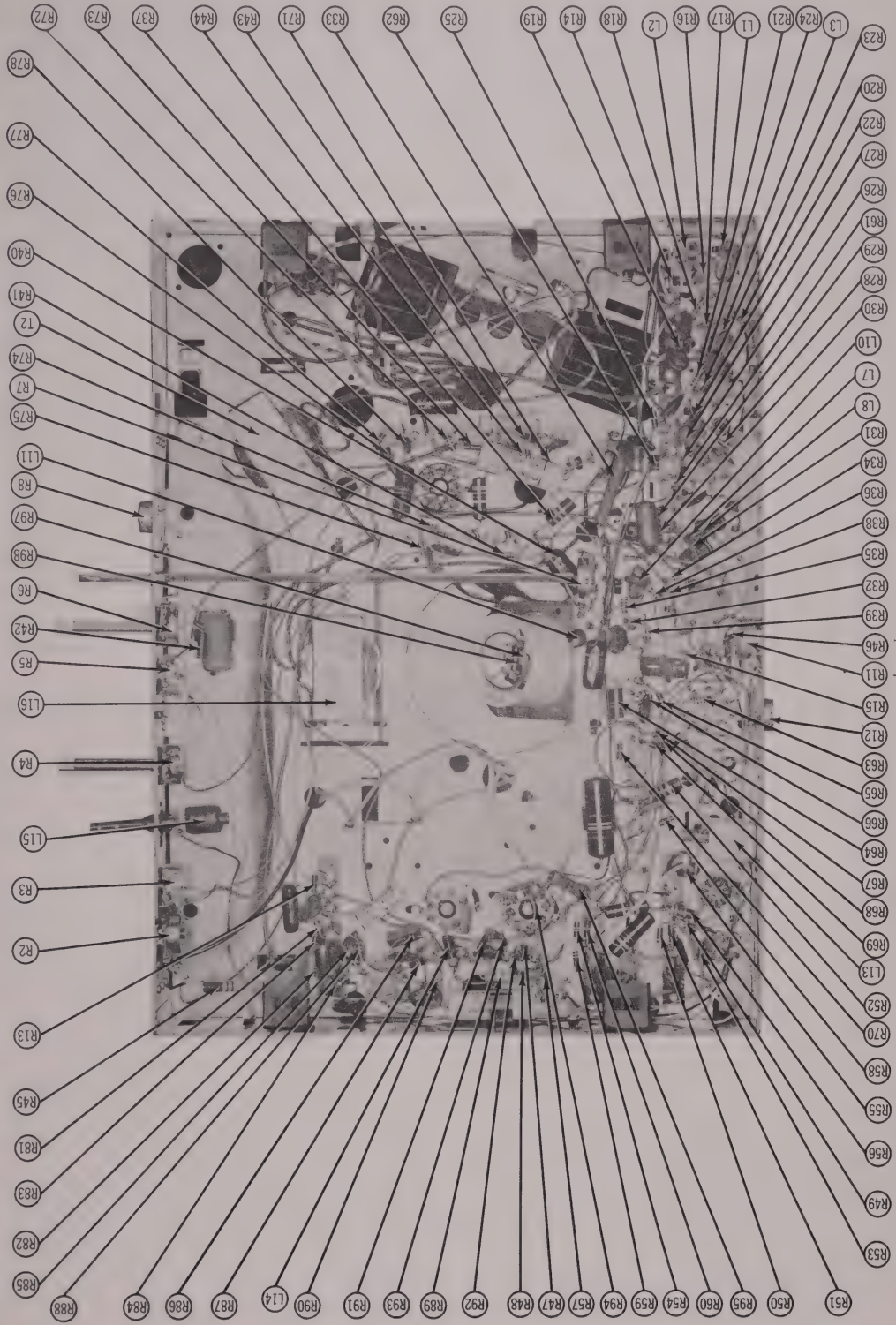
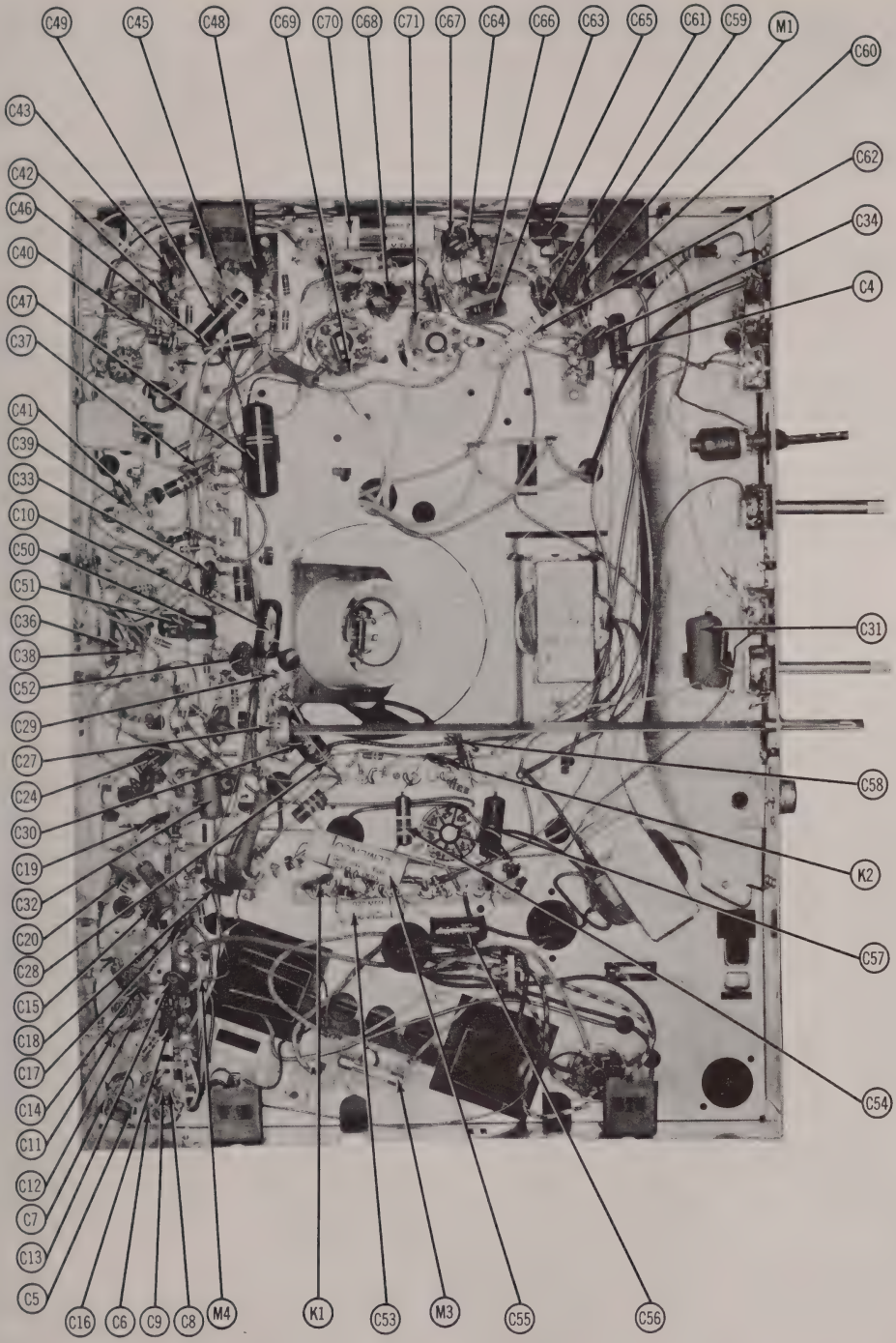
# VHF TUNER with UHF provisions 175-137

ZENITH CHASSIS
16E27, U, Q, S-48434

CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.






CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | CBS / GENERAL ELECTRIC | TYPE | ITEM No. | RAYTHEON / SYLVANIA | TYPE |
|---|---|---|---|---|---|
| V1 | 1st Video IF Amp. | 6BZ6 | V7 | Audio Output | 6BQ5 |
| V2 | 2nd Video IF Amp. | 6BZ6 | V8 | Vert. Mult. - Vert. Output | 6EA7 (6EM7) * |
| V3 | 3rd Video IF Amp. | 6DK6 | | | |
| V4 | Video Output - Sound IF Amp. | 6EB8 | V9 | Horiz. AFC - Horiz. Osc. | 6GH8 |
| V5 | AGC Keying - Sync Sep. - Noise Limiter | 6BU8 | V10 | Horiz. Output | 6DQ6B |
| V6 | Audio Det. | 6BN8 | V11 | Damper | 6DE4 (6AX4GTB) * |
| | | | V12 | HV Rectifier | 1J3GT |
| | | | V13 | L.V Rectifier | 5V3 (5DG4) * |

* Alternate

## PICTURE TUBE

| ITEM No. | REPLACEMENT DATA: ZENITH PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|
| V14 | 21CXP4 | 21CXP4 ① | 21CXP4 ① | 21CXP4 ① | 21CXP4 ④ | ① Aluminized ③ Silver Screen "85" |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING: CAP. | VOLT | ZENITH PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | FYEAMAG PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▬40 | 400 | 22-3137 | AFH4-100-40 | CG89O | FP333.2 | TMT-109 | TVL-4663.4 | |
| B | ▬80 | 400 | | | | | | | |
| C | ▬100 | 50 | | | | | | | |
| C2A | ▬40 | 450 | 22-3152 | AFH2-89-50 | BO652 | FP229.53 | | TVL-2708.9 | |
| B | ▬50 | 25 | | | | | | | |
| C3A | ▬4 | 350 | 22-3201 | AFH2-46 | BO362 | WP230.9 | TMD-46 | TVL-2748 | |
| B | ▬4 | 150 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | REMARKS | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C4 | .068 | 200V | | P288N-068 | | CUB4S68 | 4DP-3-683 | GEM-4166 | 8TM-S68 |
| C5 | 470 | | | BPD-00047 | DD-471 | BYA0T68 | CCD-471 | B-347 | 10TS-T47 |
| C6 | 4.5 | NPO | s. 5mmf | NPO-D1 4.7 | DT2-4R7 | C10V47C | CCTO-4R7 | CNO-547 | 10TCC-V47 |
| C7 | 1000 | | 10% | D1-1000 | DD-102 | WMBTT | CCD-102 | GP20 | 10TS-D10 |
| C8 | 13 | NPO | 5% | | TC2-12 | C10Q12C | | CNO-412 | 10TCC-Q12 |
| C9 | 13 | NPO | 5% | | TC2-12 | C10Q12C | | CNO-412 | 10TCC-Q12 |
| C10 | .15 | 200V | | P288N-15 | | CUB2P15 | 2DP-3-154 | GEM-2015 | 2TM-P15 |
| C11 | 1 | | 10% | NPO-S1 1.0 | TC2-1 | | | CNO-510 | 10TCC-V10 |
| C12 | 1.7 | NPO | s. 5mmf | NPO-D1 6.8 | DT2-6R8 | C10V68C | CCTO-6R8 | CNO-568 | 10TCC-V68 |
| C13 | 10000 | | | BPD-01 | DD-103 | BYA10SI | CCD-103 | B-110 | 5HK-S10 |
| C14 | 1000 | | 10% | D1-1000 | DD-102 | PM6DI | CCD-102 | GP20 | 10TS-D10 |
| C15 | 470 | | 10% | D1-470 | DD-471 | 5RST47 | CCD-471 | GP347 | 10TS-T47 |
| C16 | 470 | | 10% | D1-470 | DD-471 | 5RST47 | CCD-471 | GP347 | 10TS-T47 |
| C17 | 1000 | | 10% | D1-1000 | DD-102 | PM6DI | CCD-102 | GP20 | 10TS-D10 |
| C18 | 100 | | 10% | DI-100 | DD-101 | L10TI | CCD-101 | GP310 | 10TS-T10 |
| C19 | 470 | | 10% | 1469-00047 | | CM-19B-471K | MCJ344 | MS-347 | |
| C20 | 470 | | 10% | D1-470 | DD-471 | 5RST47 | CCD-471 | GP347 | 10TS-T47 |
| C21 | 5.5 | N470 | s. 5mmf | #22-3221 | | | | | |
| C22 | 4.7 | | 10% | | NPO-S1 4.7 | TC2-4R7 | C10V47C | CCTO-4R7 | CNO-547 | 10TCC-V47 |
| C23 | 4.7 | | 10% | | NPO-S1 4.7 | TC2-4R7 | C10V47C | CCTO-4R7 | CNO-547 | 10TCC-V47 |
| C24 | .032 | 200V | 10% | | W4C2S33-10% | | PM8S33 | 4DP-2-333 | GEM-1613 | 6TM-S33 |
| C25 | 47 | NO8O | 5% | #22-3467 | | | | * | | |
| C26 | 3.3 | | 10% | | NPO-S1 3.3 | TC2-3R3 | C10V33C | CCTO-3R3 | CNO-533 | 10TCC-V33 |
| C27 | 27 | | 10% | | NPO-S1 27 | D6-270 | L10Q27 | CCD-270 | GP427 | 10TS-Q27 |
| C28 | 50 | | 10% | | SI 50 | D6-500 | L10Q5 | CCD-500 | GP450 | 10TS-Q50 |
| C29 | 10 | | 10% | | NPO-SI 10 | D6-100 | L10QI | CCD-100 | GP410 | 10TS-Q10 |
| C30 | .1 | 400V | | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C31 | .22 | 600V | - | Note 1 | P688N-22 | | CUB6P22 | 6DP-5-224 | GEM-6022 | 6TM-P22 |
| C32 | .1 | 400V | | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C33 | 10000 | | | | BPD-01 | DD-103 | BYA10SI | CCD-103 | B-110 | 5HK-S10 |
| C34 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5DI | CCD-102 | GP20 | 10TS-D10 |
| C35 | 500 | | | | EI 50 | D6-500 | L10S5 | CCD-500 | GP450 | 10TS-Q50 |
| C36 | 4.3 | | 10% | | NPO-S1 4.7 | TC2-4R7 | C10V47C | CCTO-4R7 | CNO-547 | 10TCC-V47 |
| C37A | 1000 | | 10% | | DI-1000 | DD-102 | 1R5DI | CCD-102 | GP20 | 10TS-D10 |
| B | 1000 | | 10% | | DI-1000 | DD-102 | 1R5DI | CCD-102 | GP20 | 10TS-D10 |
| C38 | 470 | | 10% | | 1469-00047 | | 5RST47 | CM-19B-471K | MCJ344 | MS-347 |
| C39 | 7.3 | | 10% | | NPO-SI 8.2 | D8-7R5 | L10V8 | | GP540 | 8TS-V7S |
| C40 | 100 | | | | BPD-0001 | DD-101 | L10TI | CCD-101 | GP310 | 10TS-T10 |
| C41 | 30 | N075 | 10% | #23-3139 | | | | | | |
| C42 | 10000 | | | | BPD-01 | DD-103 | BYA10SI | CCD-103 | B-110 | 5HK-S10 |
| C43 | 470 | | | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | B-347 | 10TS-T47 |
| C44 | 4700 | | 10% | | DI-4700 | | PM8D47 | CCD-472 | J1-347 | 10TS-D47 |
| C45 | 100 | N750 | 5% | | | DTN-100 | C10TIJ | CCTN-101 | GMT-310 | 10TC-T10 |
| C46 | .0068 | 200V | 10% | | W4C2D68-10% | | WMBTMB | 6DP-1-682 | GEM-16268 | 6TM-D68 |
| C47 | .22 | 200V | 10% | | W4C2F22-10% | | PM8D22 | 6DP-4-224 | GEM-2022 | 2TM-P22 |
| C48 | 10000 | | | | BPD-01 | DD-103 | BYA10SI | CCD-103 | B-110 | 5HK-S10 |
| C49 | .047 | 200V | | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C50 | .1 | 400V | | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C51 | 3300 | | | | BPD-0033 | DD-332 | BYA10D33 | CCD-332 | B-233 | 5HK-D33 |
| C52 | 470 | | 10% | | D1-470 | DD-471 | 5RST47 | CCD-471 | GP347 | 10TS-T47 |
| C53 | .022 | 400V | 10% | | W4C4S22-10% | | PM4S22 | 4DP-2-223 | GEM-1612 | 4TM-S22 |
| C54 | .0068 | 200V | 10% | | W4C2D68-10% | | PM6D68 | 6DP-1-682 | GEM-16268 | 6TM-D68 |
| C55 | .1 | 600V | | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C56 | .1 | 400V | | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C57 | .015 | 1000V | 10% | | | | | 1BDP-4-153 | GEM-16125 | 10TM-S15 |
| C58 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5DI | CCD-102 | GP20 | 10TS-D10 |
| C59A | 51 | | | | DI-50 | DD-510 | L10Q5I | CCD-500 | GP450 | 10TS-Q50 |
| B | 51 | | | | DI-50 | DD-510 | L10Q5I | CCD-500 | GP450 | 10TS-Q50 |
| C60A | 1000 | | 10% | | D1-1000 | DD-102 | PM6DI | CCD-102 | GP20 | 10TS-D10 |
| B | 1000 | | 10% | | D1-1000 | DD-102 | PM6DI | CCD-102 | GP20 | 10TS-D10 |
| C61 | 470 | | | | D1-470 | DD-471 | 5RST47 | CCD-471 | B-347 | 10TS-T47 |
| C62 | .047 | 200V | | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA: AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C63 | 330 | 10% | | 1469-00033 | | 5R5T33 | CM-19B-331K | MCB241 | MS-333 |
| C64 | 1500 | 10% | | 1464-0015 | | 1R5D15 | CM-19B-152K | MCB456 | MS-215 |
| C65 | ▬▬ | 10% | | 1464-0022 | | 1R5D22 | CM-19B-222K | MCJ459 | MS-222 |
| C66 | 470 | | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | B-347 | 10TS-T47 |
| C67 | 10000 | | | BPD-01 | DD-103 | BYA10SI | CCD-103 | B-110 | 5HK-S10 |
| C68A | 1500 | | | | | | CCD-152 | ▬▬▬ | |
| B | 1500 | | | BPD-02X0015 | DD3-152 | BYC5DD15 | CCD-152 | ▬▬▬ | 5HK-2XD15 |
| C69 | 10000 | | | BPD-01 | DD-103 | BYA10SI | CCD-103 | B-110 | 5HK-S10 |
| C70 | .1 | 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C71 | 75 | N500 | 4000V 10% | #22-2954 | | | | | |
| C72 | 68 | 3000V | 10% | Note 2 | | | HVA20Q68 | | 2DY-468 |

# Zenith Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in late production models.
Note 2. Part of Yoke Assembly (T3).

## CONTROLS

| ITEM No. | RATING: RESISTANCE | WATTS | REPLACEMENT DATA: ZENITH PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2meg | ½ | 63-4659 | | | B1B-1392X | PP2BT16 | Volume |
| B | Shaft | | | | | | | |
| C | Switch | | | | | SK9 | DS-37 | |
| R2A | 2meg | ½ | 63-4455 | AB-S4 | B47-2meg-S | B1J-140 | SU-59 | Power Off-On |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | Focus |
| R3A | 5meg | ½ | 63-4013 | AB-S8 | B47-5meg-Z | B1J-141 | U68 | |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | Fringe Lock (Sync Stab.) |
| R4A | 750K | ½ | 63-4677 | B-S6 | A47-750-S | QU-136 | BU7547 | Vert. Hold |
| B | Bushing | | | Not Req. | Not Req. | Not Req. | SL-38 | |
| C | Shaft | | | Not Req. | K2S-3 | Not Req. | SL2500 | |
| R5A | 5meg | ½ | 63-4060 | B-S7 | A47-5meg-S | SLC3 | U67 | Vert. Size (Height) |
| B | Shaft | | | Not Req. | K2S-3 | Not Req. | Not Req. | |
| R6A | 250K | ½ | 63-4676 | B-S0 | A47-250K-S | QU-130 | U66 | Brightness |
| B | Shaft | | | Not Req. | K2S-3 | Not Req. | Not Req. | |
| R7 | 30K | ½ | 63-4689 | | | | | Contrast |
| | 10K Tap | | | | | | | |
| R8 | 1500Ω | 2(WW) | 63-4630 | WN-152 * | 39-1500 * | 113-1500 * | FL-1.5K * | Vert. Linearity |
| | 3000 Beq. | | | | | | | |
| R9A | 1meg | ½ | 63-4499 | AB-T0 | A47-1meg-Z | B1J-137 | U53 | Treble |
| B | Shaft | | | AK-9 | R8-3/16 | SK9 | DS-37 | |
| R10A | 2meg | ½ | 63-4592 | AB-S5 | | B1J-140 | U65 | Bass |
| B | Shaft | | | AK-8 | | SK9 | | |
| R11A | 10K | ½ | 63-4095 | AB-S4 | B47-10K-S | B1J-116 | TA14L | AGC |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | |
| R12 | 750Ω | 2(WW) | 63-3284 | WN-751 ▲ | 39-800 ▲ | 112-800 ▲ | FL-750 ▲ | Buzz Control |
| | 1000 Beq. | | | | | | | |

* Use 270Ω series resistor. ▲ Use 100Ω series resistor.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R13 | 2. 2meg | |
| R14 | 100Ω | |
| R15 | 680K | |
| R16 | 22K | |
| R17 | 22K | |
| R18 | 56Ω | |
| R19 | 1500Ω | |
| R20 | 56K | |
| R21 | 56K | |
| R22 | 220Ω | |
| R23 | 220 | |
| R24 | 330Ω | |
| R25 | 1meg | |
| R26 | 18K | |
| R27 | 8200Ω 3W | |
| R28 | 470Ω | |
| R29 | 3700Ω | |
| R30 | 27K | |
| R31 | 330Ω | |
| R32 | 39K | |
| R33 | 7500Ω 4W | |
| R34 | 100K | |
| R35 | 47K | |
| R36 | 15K | |
| R37 | 27K 2W | |
| R38 | 15Ω | |
| R39 | 100K | |
| R40 | 3900Ω | |
| R41 | 120K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R42 | 1.5meg | Note 1 |
| R43 | 150K | |
| R44 | 180K | |
| R45 | 470K | |
| R46 | 100K | |
| R47 | 220K | |
| R48 | 220K | |
| R49 | 390K | |
| R50 | 680Ω | |
| R51 | 470Ω | |
| R52 | 27K 2W | |
| R53 | 3.2meg | |
| R54 | 100K | |
| R55 | 10K | |
| R56 | 470Ω 1W | |
| R57 | 220Ω | |
| R58 | 2300Ω | |
| R59 | 4700Ω | |
| R60 | 150K | |
| R61 | 330K | |
| R62 | 3.3meg | |
| R63 | 680K | |
| R64 | 22K 2W | |
| R65 | 6.2meg | |
| R66 | 100K | |
| R67 | 150K | |
| R68 | 82K | |
| R69 | 33K | |
| R70 | 22K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R71 | 56K | |
| R72 | 330K | |
| R73 | 2.2meg | |
| R74 | 68K | |
| R75 | 82K | |
| R76 | 1000Ω | |
| R77 | 2.2meg | |
| R78 | 470Ω 1W | |
| R79 | 560Ω | |
| R80 | 560Ω | |
| R81 | 100K | |
| R82 | 330K | |
| R83 | 330K | |
| R84 | 1meg | |
| R85 | 120K | |
| R86 | 100K | |
| R87 | 100K | |
| R88 | 15meg | |
| R89 | 120K 2W | |
| R90 | 47K | |
| R91 | 15K | |
| R92 | 100Ω | |
| R93 | 1meg | |
| R94 | 100Ω | |
| R95 | 8200Ω 3W | |
| R96 | 1000Ω | |
| R97 | 6.8Ω | |
| R98 | 22K 1W | |
| R99 | 230K | |

Note 1. Not used in late production models.

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | ZENITH PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Vert. Integrator | | 87-5 | Sprague V-15 |
| K2 | Vert. Feedback | | 87-4 | Sprague V-14 |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA: ZENITH PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1A | 1st Video IF | S-48045 | | | | | | |
| B | 41.25MC Trap | | | | | | | |
| L2A | 39.75MC Trap | S-41883 | | | | | | |
| B | 47.25MC Trap | | | | | | | |
| L3A | 2nd Video IF | S-41881 | | | | | | |
| B | 47.25MC Trap | | | | | | | |
| L4 | 3rd Video IF | S-46741 | | | | | | |
| L5 | 4th Video IF | S-47958 | | | | | | |
| L6 | Series Peaking Coil | S-41879 | 19-3093 | 19-3093 | TV-181 | 6177 | VP-3 | 90uh |
| L7 | RF Choke | S-21889 | 19-1004 | 19-1004 | BC-565 | 4610 | | 6uh |
| L8 | Shunt Peaking Coil | S-42619 | 19-3180 | 19-3180 | TV-184 | 6180 | VP-5 | 17uh |
| L9A | 4.5MC Trap | S-43125 | | | | | | |
| B | 1st Sound IF | | | | | | | |
| L10 | Shunt Peaking Coil | S-16011 | 19-3250 | 19-3250 | TV-185 | 6181 | VP-6 | 250uh |
| L11 | Series Peaking Coil | S-43618 ① | 19-3180 * | 19-3180 * | TV-184 * | 6180 * | VP-5 * | 170uh |
| L12 | 2nd Sound IF | S-43717 | 17-102 ▲ | 17-102 ▲ | TV-169 | | | |
| L13 | Quadrature Coil | S-47702 | 20-1005 | ▬▬▬ | TV-121 | 1480 | | |
| L14 | RF Choke | S-22777 | 19-1005 | 19-1005 | BC-586 | 4612 | | 10uh |

① Wound on 5600Ω Resistor. * Parallel with 5600Ω Resistor. ▲ Enlarge mounting hole.

## TRANSFORMER (HORIZ. OSC.)

| ITEM No. | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: ZENITH PART No. | Halldorson PART No. | Merit PART No. | Miller PART No. | Ram PART No. | Thordarson PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| L25 | 238Ω | | S-47150 | | | | | | Horiz. Osc., Tap② 95Ω |

## FILTER CHOKE

| ITEM No. | RATINGS: CURRENT (Measured) | DC. RES. | INDUCTANCE ① CURRENT 1000 (mA) | REPLACEMENT DATA: ZENITH PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L16 | .275A | 52Ω | 1.4 Hy. | 95-1559 | 26C44 | C-2996 | F-800 ① | C-2326 ① | 26C44 | C-28X |

① Drill new mounting hole.

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | SEC. 1 | SEC. 2 | REPLACEMENT DATA: ZENITH PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ① L-BA | 560 VCT ② 280A Tap ③ 510VCT ④ 250mA | 5V ⑤ 3.8A Tap ⑥ 3V | 95-1726 | | | | | | |
| | SEC. 3 | | | | | | | | | |
| | 6.3V ⑦ 8.5A | | | | | | | | | |

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA: ZENITH PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Rogers PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T2 | Vert. Output | 95-1656A | 26S75 ①② | A-282 | V314 | V335 ③ | A-8149 | 26S75 ①② | A-131X |
| T3 | Alt. Vert. Output | 95-1656 | 26S75 ①② | A-282 | V314 | V335 ③ | A-8149 | 26S75 ①② | A-131X |
| | Yoke Horiz (13.63MH) (90°) Vert. (46MH) Rear Cover and Centering Device | 95-1654 | Y-39 ④ | MDF-H ⑤⑥⑦ | T90F12/47 ⑤⑥⑦ | PCM1045 ⑤⑥⑦ | DY-13A ⑤⑥⑦ | Y-39 ④ | Y-40 & NW-3 ④ YC-112 |
| T4 | Horiz. Output | S-46592 | | | | | | | |

① Use 6 : 1 Turns Ratio. ③ Connect as Autoformer. ⑤ Cut and tape Green Lead.
④ Connect Yoke Terminal #4 to Horiz. Output Transformer Terminal #4; Yoke #7 to Horiz. Output #2; Connect 1K ½ Watt Resistor from Yoke #3 & #5 to Horiz. Output #3.
⑤ Use Universal Rear Cover and Centering Device and Yoke Damping Capacitor, if necessary.
⑥ Connect Yoke Terminal #3 to Horiz. Output Transformer #4; Yoke #1 to Horiz. Output #2; Connect 1K ½ Watt Resistor from Yoke #3 & #7 to Horiz. Output #3.
⑦ Cut and form a piece of .010 gauge flat paper inside the Yoke itself and support with acetate cement, to provide an insulation between width sleeve and the yoke proper.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE: PRI. | SEC. | REPLACEMENT DATA: ZENITH PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T5 | 4000Ω | 3-4Ω | 95-1703 | 26S49 ① | A-2935 | AU-800 ① | A-3677 ① | 26S49 ① | S-5X ① Drill new mounting hole. |

## SPEAKER

| ITEM No. | TYPE: SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA: ZENITH PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" x 9" PM | | 6-8Ω | 49-831 ① | 69A12S6.8 | ① Used in Models E3458W, E3460M, R, E3014W. |
| SP2 | 6" x 9" PM | | 6-8Ω | 49-831 ① | 69A12S6.8 | ② Used in Models E3012H, R, E3018, E3015L. |
| SP3 | Electrostatic | | | S-21829 ①② | | |
| SP4 | Electrostatic | | | S-21829 ①② | | |
| | | | | 49-830 ② | | |
| | | | | 49-830 ② | | |

ZENITH CHASSIS 16E27, U, Q, S-48434

FOLDER 2

# PARTS LIST AND DESCRIPTIONS (Continued)

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | ZENITH PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M1 | | 103-20 * | SD-91 ♦ | K1615 * | | | * Dual Selenium<br>♦ Silicon (2 Required) |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | ZENITH PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M2 | N | 7/10A 250V S/B | 136-38 | 62-21 | 333.750 (N 7/10A 250V S/B) | 346010 | N 7/10 | HN 1/2 to 3/4 |
| M3 | 3AG | 5A 125V S/B P/T | 136-42 | | 315005 (5A 125V S/B P/T) | | MDV-5 | |
| M4 | 1 1/2" | length of #24 wire | | | | | | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | ZENITH PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M5 | | 103-23 | 1N60 | 1N60 | 1N64 | Video Det. (Pigtail) |

## MISCELLANEOUS

| ITEM No. | PART NAME | ZENITH PART No. | NOTES |
|---|---|---|---|
| M6 | Tuner | 175-138 | VHF |
| | Tuner | 175-137 | VHF with UHF Provisions |
| | Tuner | 175-8 | UHF |

## CABINETS & CABINET PARTS

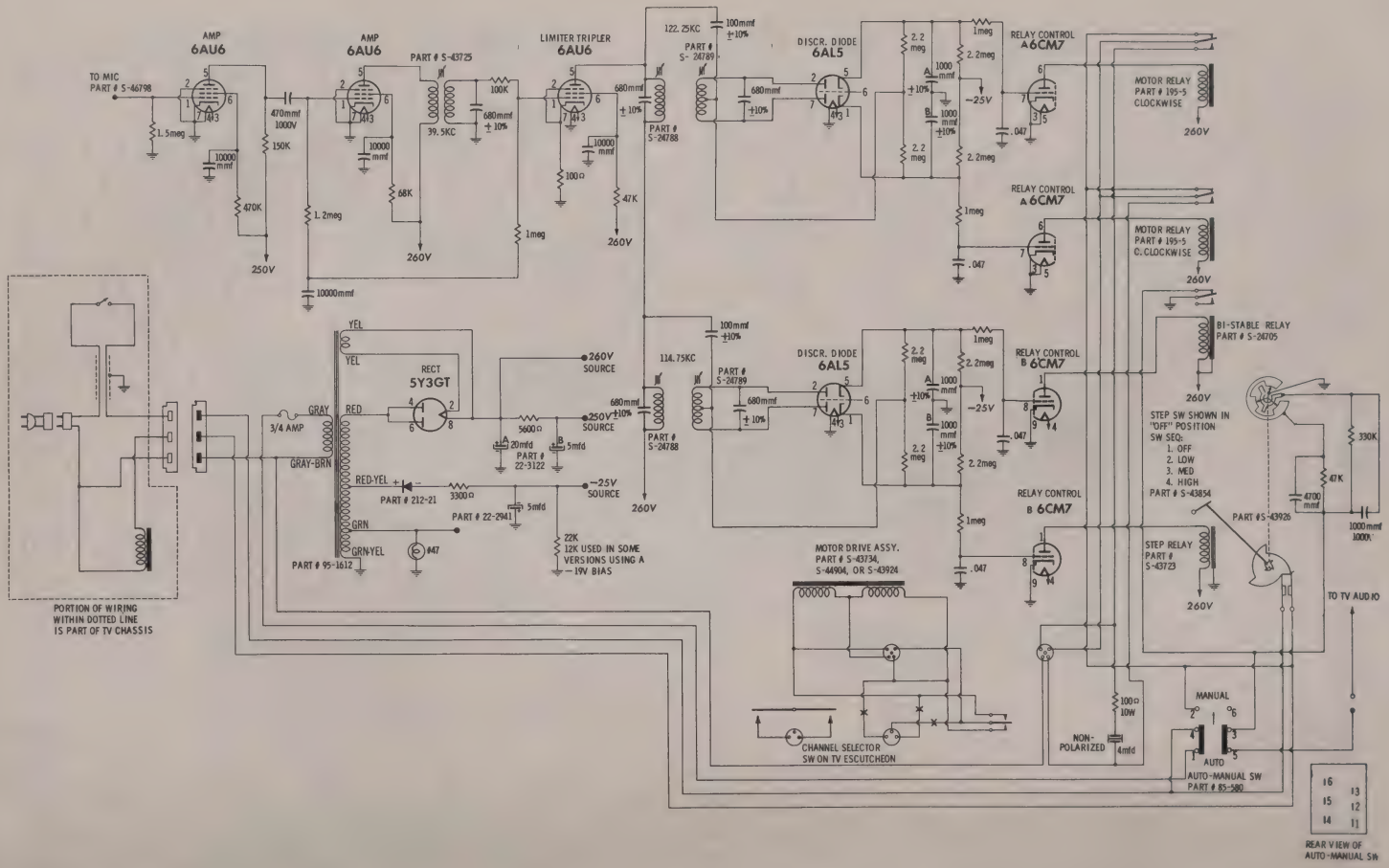
**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Safety Glass | 192-279 | Notes 1 and 2 |
| Knob | 46-2341 | Channel Selector, Note 1 |
| Knob | S-47420 | Channel Selector, Note 2 |
| Knob | S-49420 | Fine Tuning, Note 1 |
| Knob | 46-2035 | Fine Tuning, Note 2 |
| Knob | S-48228 | UHF Dial, Note 1 |
| Knob | S-46726 | Volume, Notes 1 and 2 |
| Knob | S-48431 | Contrast, Notes 1 and 2 |
| Knob | 46-1118 | Horizontal Hold, Notes 1 and 2 |
| Knob | S-45716 | Tone, Note 1 |
| Knob | S-45726 | Tone, Note 2 |
| Cabinet | 14-3021 | Model E2458W |
| Cabinet | 14-3024 | Model E2460M |
| Cabinet | 14-3025 | Model E2460R |
| Cabinet | 14-3068 | Model E3012H |
| Cabinet | 14-3067 | Model E3012R |
| Cabinet | 14-3069 | Model E3013H |
| Cabinet | 14-3070 | Model E3014W |
| Cabinet | 14-3071 | Model E3015L |

Note 1. Models E2458W, E2460M, R.
Note 2. Models E3012H, R, E3013H, E3014W, E3015L.

## WIRING DATA

| | |
|---|---|
| High Voltage Lead | Use BELDEN No. 8869 |
| Shielded Hook-up Wire | Use BELDEN No. 8885 (Single Conductor)<br>8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. 8874 |
| 300Ω Tuner Input Lead | Use BELDEN No. 8225 |
| 300Ω Antenna Lead-in | Use BELDEN No. 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor<br>8485 (Round) - 5 Conductor<br>8488 (Round) - 8 Conductor |




A PHOTOFACT STANDARD NOTATION SCHEMATIC

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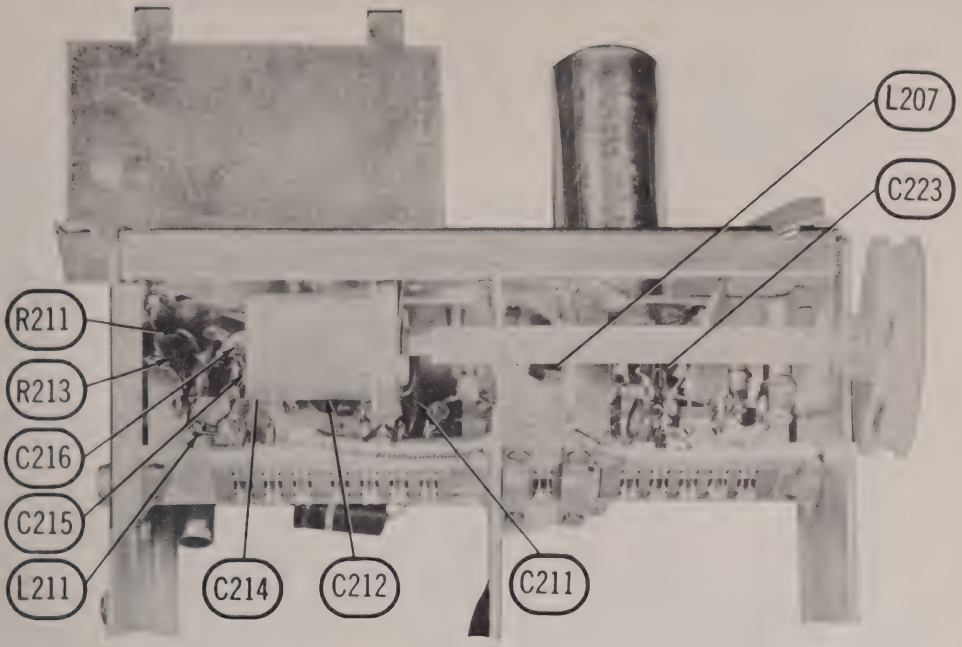
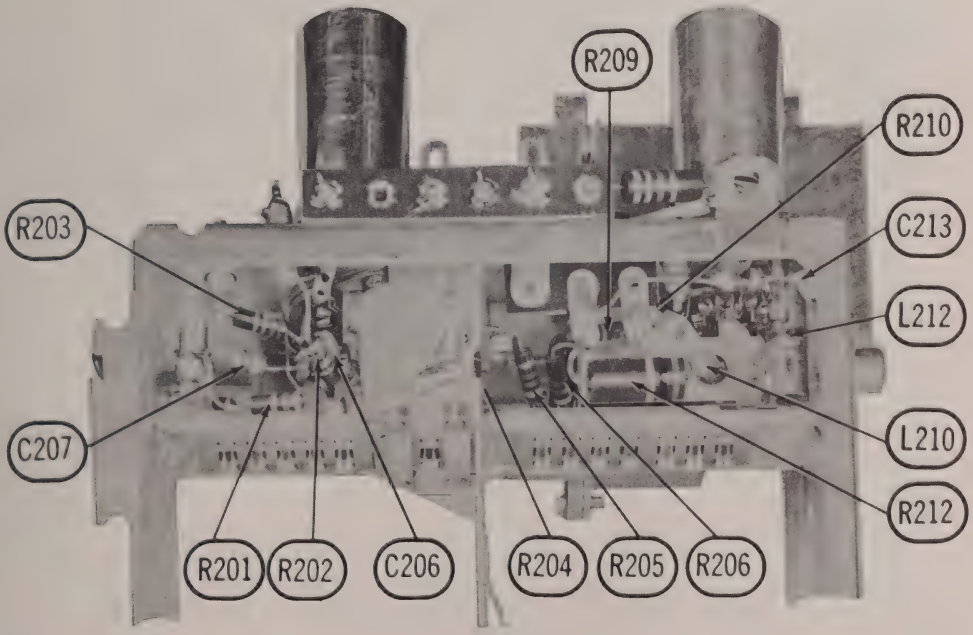
# REMOTE CONTROL RECEIVER S-48434




VHF TUNER 175-138 - LEFT SIDE




VHF TUNER 175-138 - RIGHT SIDE

# TUNER PARTS LIST AND DESCRIPTIONS

## 175-138

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V201 | RF Amplifier | 6BK7B | V202 | Mixer-Osc. | 6EA8 (6U8) * |

* Alternate

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C201 | 40 5% | | | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C202 | 40 5% | | | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C203 | 40 5% | | | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C204 | 40 5% | | | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C205 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C206 | 800 | | BPD-0008 | DD-801 | L10T8 | CCD-821 | B-382 | 5GA-T80 |
| C207 | 2.2 5% | | NPO-SI 2.2 | TCZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C208 | 2.5-6 | #22-2221 | | 829-6 | | CV-3 | CT552 | |
| C209 | .85-2.3 | #22-2453 | | 829-3 | | CV-1 | CT565 | |
| C210 | .6-3.0 | #22-2504 | | 829-3 | | CV-1 | CT565 | |
| C211 | 120 N750 5% | | | TCN-120 | C10T12U | CCTN-121 | CN7-312 | 10TCU-T12 |
| C212 | 19 2.5% | | NPO-SI 20 | TCZ-20 | C10Q2C | CCTO-200 | CNO-418 | 10TCC-Q20 |
| C213 | 2 N750 ± .5mmf | | | | | | CN7-522 | 10TCU-V22 |
| C214 | 2 10% | | NPO-SI 2.0 | TCZ-2R2 | C10V2C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C215 | 5.6 N220 ± .25mmf | #22-2499 | | | | * | | 10TCR-V56 |
| C216 | 3.4 NPO ± .25mmf | | NPO-DI 3.3 | DTZ-3R3 | C10V33C | CCTO-3R3 | CNO-533 | 10TCC-V33 |
| C217 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C218 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C219 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C220 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C221 | 800 | | BPD-0008 | DD-801 | L10T8 | CCD-821 | B-382 | 5GA-T80 |
| C222 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C223 | 800 | Note 1 | BPD-0008 | DD-801 | L10T8 | CCD-821 | B-382 | 5GA-T80 |

\# Zenith Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R201 | 47K | |
| R202 | 470K | |
| R203 | 22K | |
| R204 | 22K | |
| R205 | 4700Ω | |

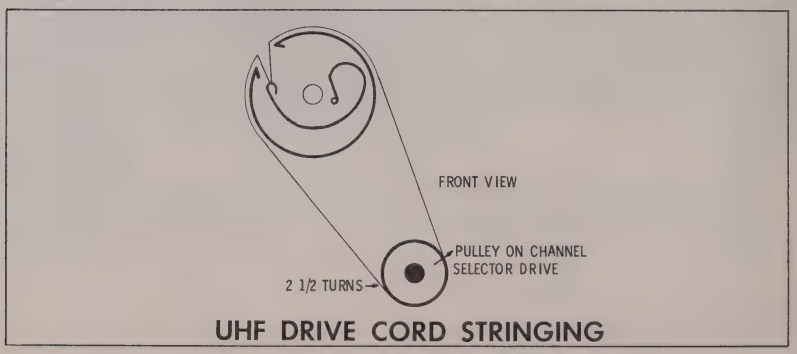
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R206 | 470Ω | |
| R207 | 220K | |
| R208 | 220K | |
| R209 | 68K | |
| R210 | 68K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R211 | 10K | |
| R212 | 10K 2W | |
| R213 | 2200Ω | |
| R214 | 470Ω 1W | |

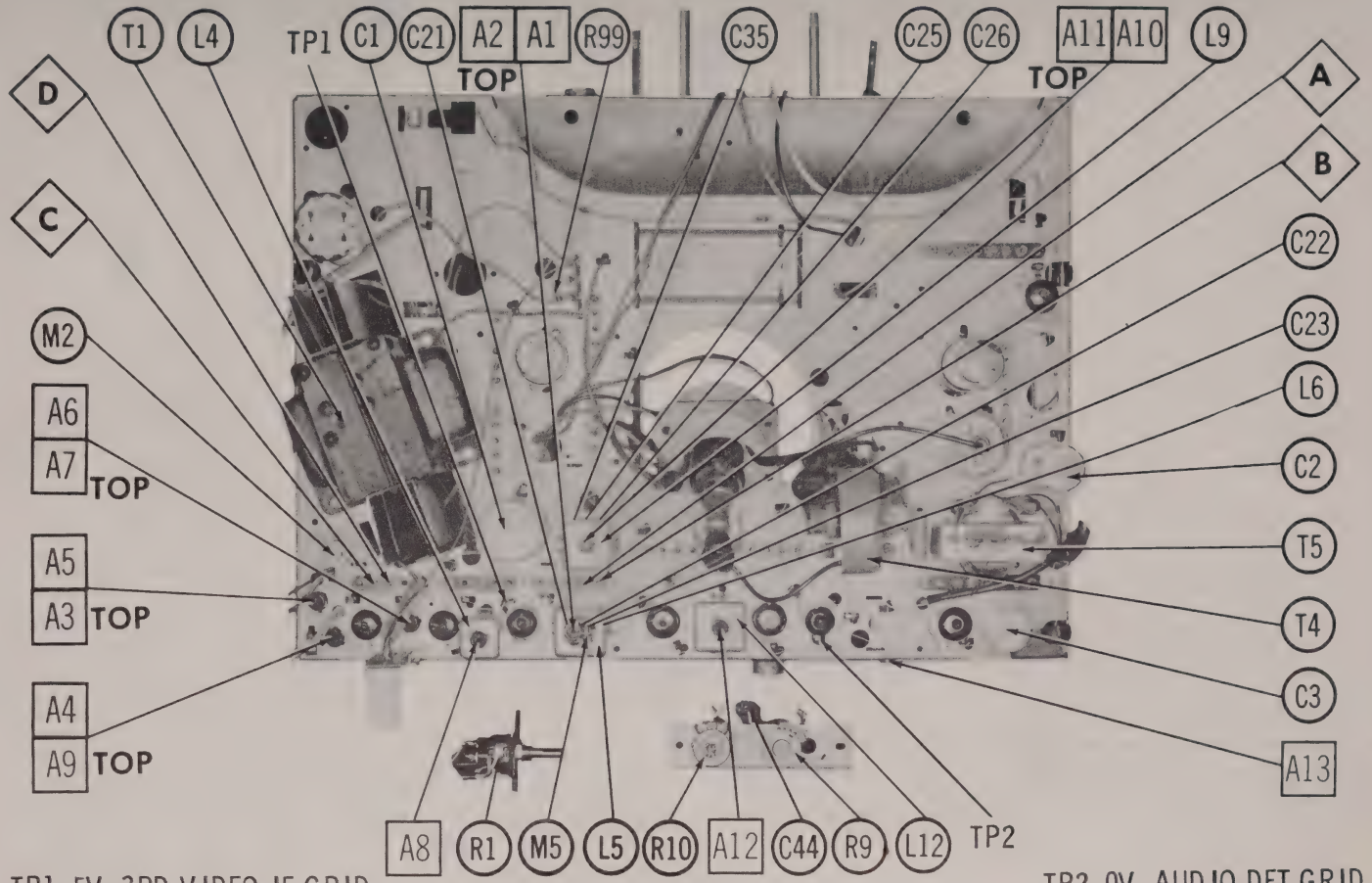
## COILS (RF-IF)

| ITEM No. | USE | ZENITH PART No. | NOTES |
|---|---|---|---|
| L201 | Ant. Coil | 20-490 | |
| L202 | Ant. Coil | 20-490 | |
| L203 | Ant. Coil | 20-505 | |
| L204 | Ant. Coil | 20-505 | |
| L205 | Ant. Coil | 20-490 | |
| L206 | Ant. Coil | 20-490 | |

| ITEM No. | USE | ZENITH PART No. | NOTES |
|---|---|---|---|
| L207 | RF Choke | 20-431 | |
| L208 | RF Plate Coil | 20-537 | |
| L209 | Mixer Grid Coil | 20-538 | |
| L210 | RF Choke | S-18859 | |
| L211 | RF Choke | 20-541 | |
| L212 | Mixer Plate Coil | S-45230 | |




UHF DRIVE CORD STRINGING




CHASSIS - TOP VIEW

ZENITH CHASSIS
16627, U, Q, S-48434

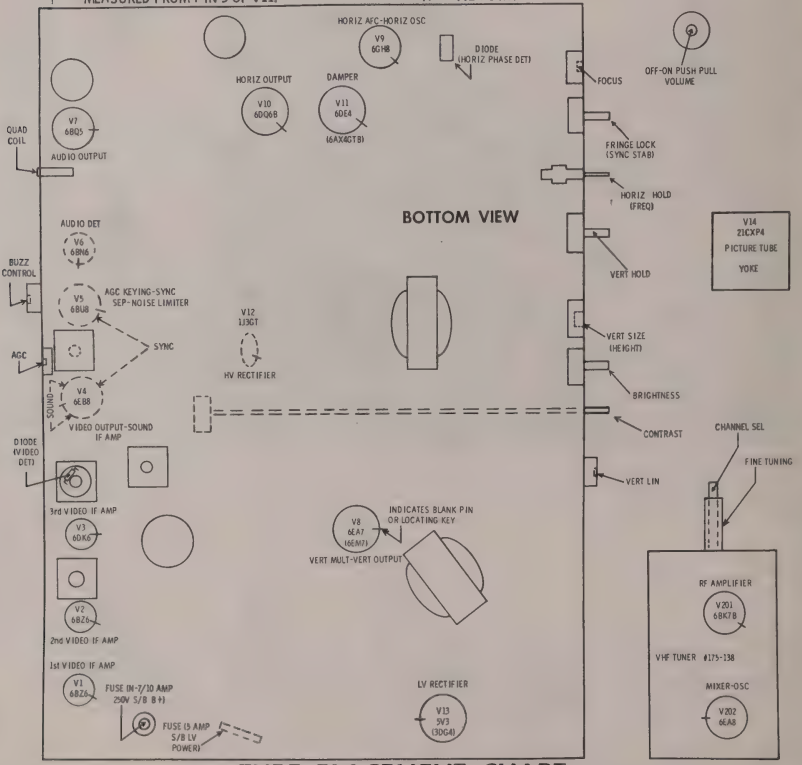
FOLDER 2

# RESISTANCE MEASUREMENTS

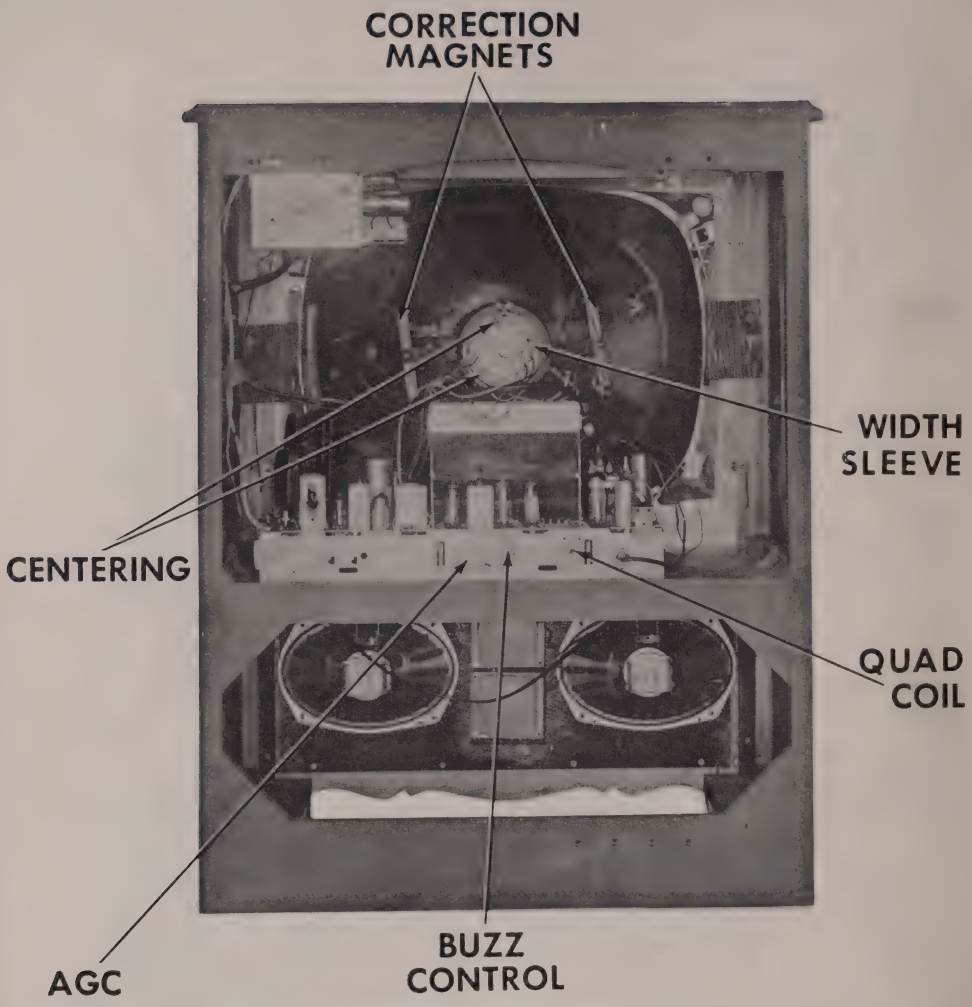
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BZ6 | 1.4meg | 1550Ω | .1Ω | 0Ω | ▲240Ω | ▲240Ω | 1500Ω | | |
| V2 | 6BZ6 | 35K | ▲22Ω | .1Ω | 0Ω | †220Ω | †220Ω | INF | | |
| V3 | 6DK6 | 18K | 470Ω | .1Ω | 0Ω | †8200Ω | †8200Ω | 0Ω | | |
| V4 | 6EB8 | 0Ω | 100K | †440K | .1Ω | 0Ω | 15Ω | 3000Ω | †27K | †7000Ω |
| V5 | 6BU8 | ● 7500Ω | †22K | 690K | .1Ω | 0Ω | †130K | †2.3meg | †80K | †8.2meg |
| V6 | 6BN6 | ● 350Ω | .2Ω | .1Ω | 0Ω | †27K | 3.7Ω | †390K | | |
| V7 | 6BQ5 | 13K | 13K | 220Ω | .1Ω | 0Ω | NC | †1100Ω | NC | †470Ω |
| V8 | 6EA7 | 2.2meg | †355Ω | ● 1000Ω | ● 650K | †●5.5meg | 0Ω | 0Ω | .1Ω | |
| V9 | 6GH8 | †100K | 100K | †47K | 0Ω | .1Ω | †120K | 98Ω | 0Ω | 1.6meg |
| V10 | 6DQ6B | TP | .1Ω | NC | †8300Ω | 1meg | TP | 0Ω | 0Ω | TOP CAP †8.7Ω |
| V11 | 6DE4 | NC | NC | ¶1meg | NC | †.1Ω | NC | 0Ω | .1Ω | |
| V12 | 1J3GT | PINS 1 THRU 8 HAVE INFINITE RESISTANCE | | | | | | | | TOP CAP †280Ω |
| V13 | 5V3 | ¶ | ¶ | ¶ | 22Ω | 20Ω | 21Ω | 23Ω | ¶ | |
| V14 | 21CXP4 | .1Ω | 0Ω | Pin 6 †●1.5meg | Pin 10 †190K | Pin 11 ●140K | Pin 12 0Ω | | | |
| V201 | 6BK7B | †940Ω | 120K | INF | 0Ω | .1Ω | INF | 3meg | 0Ω | 0Ω |
| V202 | 6EA8 | †10K | 68K | †68K | .1Ω | 0Ω | †470Ω | 0Ω | 2200Ω | 12K |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 260V SOURCE.
‡ MEASURED FROM PIN 3 OF V11.

NC NO CONNECTION
TP TIE POINT




# TUBE PLACEMENT CHART




CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold is equipped with a stop which limits rotation to approximately 270° with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to the point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.

PHOTOFACT® Folder

**PRODUCTION CHANGE
BULLETIN 240**

PRODUCTION CHANGE
BULLETIN 240

## SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 418

DEWALD MODEL N-5000B

Dewald Model L-5000 was covered in PHOTOFACT Folder 6 - Set 418.

Model N-5000B is added along with production changes with the publication of this bulletin.

COMPONENT CHANGES

R4 is increased from 15K to 100K.

R6 is decreased from 470K to 100K.

R7 is decreased from 1000Ω to 820Ω.

R8 is increased from 100K to 1meg.

R9 is decreased from 470K to 100K.

R12 is increased from 100K to 220K.

C6 is decreased from 3300mmf to 1000mmf.

C7 is decreased from 1000mmf to 120mmf.

C8 is decreased from 1500mmf to 330mmf.

COMPONENTS OMITTED

C2 is omitted.

R5 is omitted.

COMPONENTS ADDED

A 680mmf Capacitor and a 68K Resistor in series is added from Pin 3 of V1 (12AX7) to lug 6 of the Selector Switch (M2).

A Monitor Switch and a Rumble Filter Switch are added during late production. A partial schematic diagram showing the added components is given on the reverse side.

PRODUCTION CHANGE
BULLETIN 240

## SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 14 IN SET 472

SILVERTONE MODELS 58A, 59A (CH. 528.53640, 528.59670)

Silvertone Models 58, 59 (Tuner Ch. 528.53640, Amp. Ch. 528.59480) were covered in PHOTOFACT Folder 14 - Set 472.

Models 58A, 59A (Tuner Ch. 528.53640, Amp. Ch. 528.59670) are added along with late production changes with the publication of this bulletin.

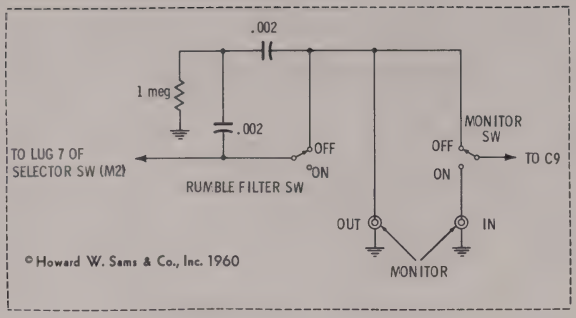
AMPLIFIER CHANGE

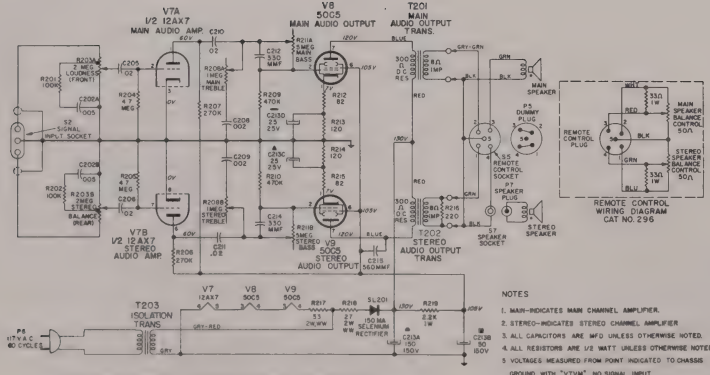
Models 58A, 59A incorporate the same Tuner Ch. (528.53640) however, a new Amp. Ch. (528.59670) is used. A schematic diagram showing this new Amp. Ch. is given on the reverse side.

SET 492 FOLDER 3

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America




Schematic Diagram Courtesy of Sears, Roebuck & Co.

NOTES

1. MAIN-INDICATES MAIN CHANNEL AMPLIFIER.
2. STEREO-INDICATES STEREO CHANNEL AMPLIFIER
3. ALL CAPACITORS ARE MFD UNLESS OTHERWISE NOTED.
4. ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE NOTED.
5. VOLTAGES MEASURED FROM POINT INDICATED TO CHASSIS GROUND WITH "VTVM", NO SIGNAL INPUT.
6. DOTS ON SPEAKERS INDICATE POLARITY.

## SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 470

CHANNEL MASTER MODEL 6506

Channel Master Model 6506 was covered in PHOTOFACT Folder 6 - Set 470.

The following changes were made during late production.

TRANSISTOR CHANGES

X2 (2S45) is changed to a Type 2S49.

X4 (2S44) is changed to a Type 2S54.

COMPONENTS OMITTED

C13 is omitted.

C15 is omitted.

COMPONENT CHANGES

R6 is decreased from 30K to 28K

C12 is decreased from 15mmf to 10mmf.

C14 is increased from 5mmf to 10mmf.

R15 is decreased from 5600Ω to 4500Ω.

R18 is decreased from 10Ω to 5Ω.

C19 is increased from 2000mmf to 5000mmf.

## SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11 IN SET 376

GENERAL ELECTRIC MODELS T-106B, T-107B

General Electric Models 875, 876, 877 were covered in PHOTOFACT Folder 11 - Set 376.

Models T-106B, T-107B are added along with late production changes with the publication of this bulletin.

CAPACITOR CHANGES

C1A, B (Filter Capacitor) is changed to Part #RS-2047.

M1 (Tuning Capacitor) is changed to Part #RS-1607 .

COIL CHANGES

L1 (Loopstick Antenna) is changed to Part #RS-1606.

L2 (Oscillator Coil) is changed to Part #RS-1523.

L3 (Input IF) is changed to Part #RS-1415.

L4 (Output IF) is changed to Part #RS-1415.

CONTROL CHANGE

R1 (Volume Control) is changed to Part #RS-1162.

SPEAKER CHANGE

SP1 (Speaker) is changed to Part #RB-1057.

TRANSFORMER CHANGE

T1 (Audio Output Transformer) is changed to Part #RS-1162.

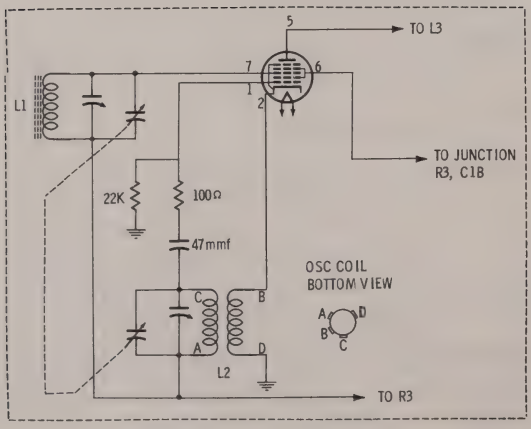
TUBE CHANGE

V1 (Converter) is changed from a Type 12AU6 to a Type 12BE6. A partial schematic diagram showing the changes is given on the reverse side.

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | RS-204 | Off-On Volume |
| Knob | RS-1152 | Tuning |
| Cabinet | RB-1019 | White (With Dial Plate), Model T-106B |
| Cabinet | RB-1085 | Turquoise (With Dial Plate) Model T-107B |
| Dial Plate | RS-1154 | Triangle |
| Dial Plate | RS-1186 | Circular |

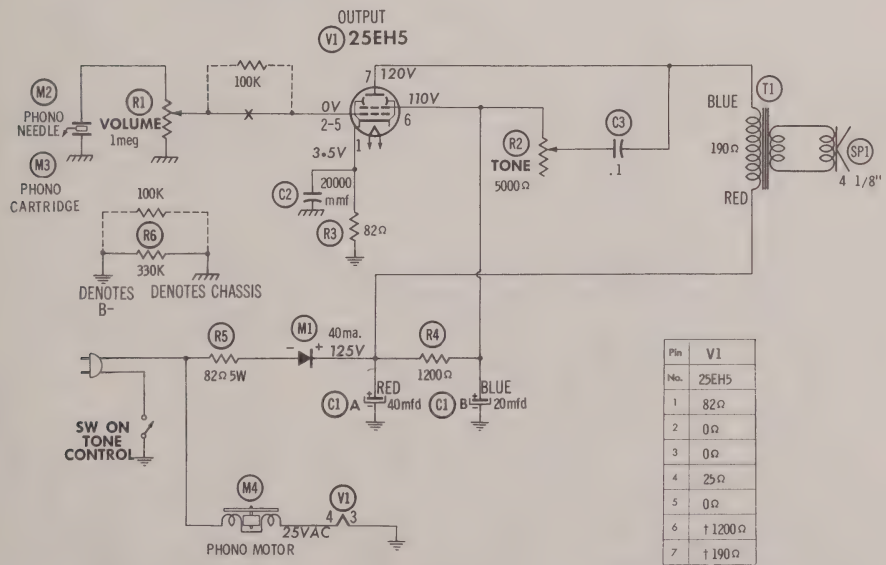

5
TO L3
7
6
1
2
L1
TO JUNCTION
R3, C1B
22K
100Ω
47mmf
OSC COIL
BOTTOM VIEW
C
B
A
D
L2
TO R3

PHOTOFACT® Folder

# ARVIN MODEL 2093
# (Ch. 11.48200)

ARVIN MODEL 2093
(Ch. 11.48200)

| | |
|---|---|
| TRADE NAME | Arvin Model 2093 ( Ch. 11. 48200) |
| MANUFACTURER | Arvin Industries, Inc., Columbus, Indiana |
| TYPE SET | AC Operated One Tube Phono Amplifier With 4 Speed Manual Record Player |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 42 Watts, .38 Amp @ 117 Volts AC |




| Pin No. | V1 25EH5 |
|---|---|
| 1 | 82Ω |
| 2 | 0Ω |
| 3 | 0Ω |
| 4 | 25Ω |
| 5 | 0Ω |
| 6 | †1200Ω |
| 7 | †190Ω |

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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JR877

DATE 7-60 SET492 FOLDER 4

SET492 FOLDER 4

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆ | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Output | 25EH5 | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | ARVIN PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | 40 | 150 | 45952-2 | PRS2180 | BERD4215 | TCD485 | TDLD-5 | TVA-2438 | |
| B | 20 | 150 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | EMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C3 | .1 100V | | P288N-1 | DF-104 | CUB2P1 | 1DP-2-104 | GEM-201 | 2TM-P1 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ARVIN PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | 44500-29 | B-70 | A47-1meg-Z | Q13-137 | U53 | Volume |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R2A | 5000Ω | ½ | 44500-28 | B-11 | A47-5000-S | Q13-114 | U14 | Tone |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | Power Off-On |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 82Ω | |
| R4 | 1200Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 82Ω 5W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R6 | 330K | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ARVIN PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 3500Ω | 3-4Ω | 46700-3 | 26S50 ① | A-3018① | AU-604① | A-3849① | 26S50 ① | S-53X ① | ① Drill new mounting hole(s) |

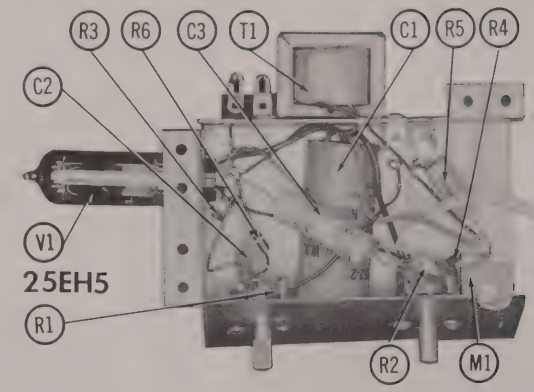
## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | ARVIN PART No. | QUAM PART No. | |
| SP1 | 4 1/8" | PM | 3-4Ω | 45600-4 | 4A1R | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | ARVIN PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
| M1 | .040A | 46140-2 * | T064 | 1234AH | 65A | SR200 | *Selenium Type |

# CHASSIS—BOTTOM VIEW




## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ARVIN PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M2 | | 420-TS-TE | N8-1 & N8-3 | | | | | | |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | ARVIN PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M3 | | | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | ARVIN PART No. | NOTES |
|---|---|---|---|
| M4 | Motor<br>Tone Arm<br>Idler Wheel | 47681<br>47332-1 | Turntable Drive, Complete<br>Walsco Part No. 1490-01 |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 47331 | Volume, Tone |
| Cabinet | 47330-31 | Gold |
| Cabinet | 47330-123 | Pink |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

PHOTOFACT® Folder

**AUTOMATIC**
**MODEL CL-75**

AUTOMATIC
MODEL CL-75

AUTOMATIC
MODEL CL-75

| | |
|---|---|
| TRADE NAME | Automatic Model CL-75 |
| MANUFACTURER | Automatic Radio Mfg., Co., Inc., 122 Brookline Ave., Boston 15, Mass. |
| TYPE SET | AC Operated 5 Tube AM Receiver With Electric Clock |
| POWER SUPPLY | 105-120 Volts AC, 60 Cycles RATING 23 Watts, .22 Amp @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 538-1610KC |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4 — GENERAL CEMENT #5097, 8727; WALSCO #2515

A5, A6 — GENERAL CEMENT #5004, 5008, 5009; WALSCO #2520

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1 | High side thru .05mfd to pin 7 (grid) of converter. Low side to chassis. | 455KC (400~ mod) | Tuning gang fully open | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. |
| 2 | Loop | 1610KC | " | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3 | " | 1400KC | Tune to 1400KC signal | " | A6 | Adjust for maximum output while rocking tuning gang. |

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JG743



SET492 FOLDER 5

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • | GENERAL ELECTRIC • | RAYTHEON • | SYLVANIA • |
|---|---|---|---|

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Converter | 12BE6 |
| V2 | IF Amplifier | 12BA6 |
| V3 | DET - AVC - AF Amp | 12AV6 (12AT6) * |
| V4 | Output | 50C5 |
| V5 | Rectifier | 35W4 |

* Alternate Type

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA AUTOMATIC PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 50 | 150 | CE-601C ① | PRS2200 | BBRD5315 | WD210 | TDLD-8 | TVA-2450 | |
| B | 30 | 150 | | | | | | | |

① Part #CE5030-150 may be used in some versions.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C2 | .047 | 400V | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C3 | 100 | N750 | | N750-DI 100 | DTN-100 | C10T1U | CCTN-101 | CN7-310 | 10TCU-T10 |
| C4 | .01 | 600V | | P688N-01 | D6-103 | CUB6S1 | 6DP-2-103 | GEM-611 | 6TM-S1 |
| C5 | .047 | 400V | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C6 | .1 | 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA AUTOMATIC PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | RV-75 | B-60 | A47-500K-Z | Q13-133 | U48 | Volume Note 1 |
| B | Shaft | | | Not Req | FS-3 | Not Req | Not Req | |

Note 1. Some versions may use 750K in this application.

## RESISTORS

**All wattages 1/2 watt, or less, unless otherwise listed.**

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 1.2meg | (2.2meg) * |
| R3 | 27K | (22K) * |
| R4 | 330Ω | (82Ω) * |

*Alternate Value

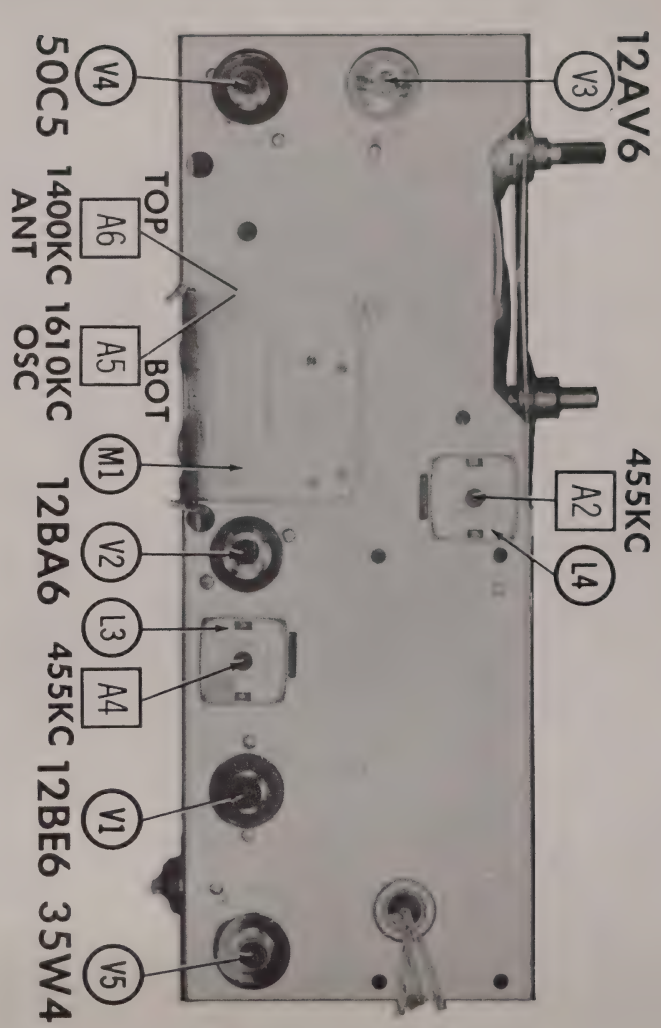
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 150Ω | |
| R6 | 1500Ω 1W | |
| R7 | 33Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R8 | .240K | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | AUTOMATIC PART No. | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| K1 | Audio Coupling | 220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg | PC-151 | Aerovox<br>Centralab<br>Cornell-Dubilier<br>Mallory<br>Sprague | PA-113-2<br>PC-151<br>116TM2<br>MS-107<br>DT-2 |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | AUTOMATIC PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | LA-100 | | | BC-419 | | | |
| L2 | Osc Coil | L-204 | 14-1074 | 14-1074 | BC-394 † | 70-OSC † | | |
| L3 | Input IF Trans | 1655-6 | 16-6758 | 16-6758 | BC-352 | 12-C1 | RF-1 | |
| L4 | Output IF Trans | 1655-6 | 16-6758 | 16-6758 | BC-353 | 12-C2 | RF-2 | |

†Disregard Tap

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | AUTOMATIC PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2200Ω | 3-4Ω | TO-3252 | 24853 | A-3025 | AU-605 | A-3332 | 24853 | S-12X | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | AUTOMATIC PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | PM-75 | 4A1 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | AUTOMATIC PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap | CV-500 | 2 Gang (Ant 43-462mmf, Osc 34-200mmf) |
| M2 | Clock | C88G5 | |

## CABINETS & CABINET PARTS

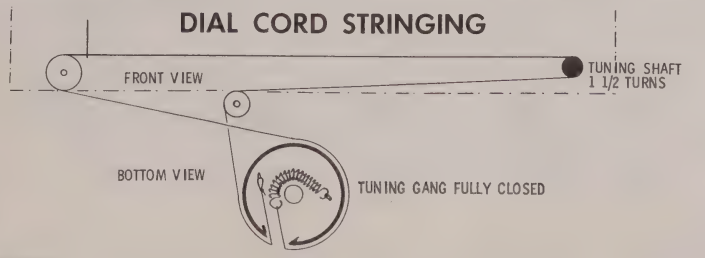
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | H80 | Tuning, Volume |
| Knob | H81 | Clock |
| Pointer | PS-75 | |
| Cabinet | H75 | Specify Color |

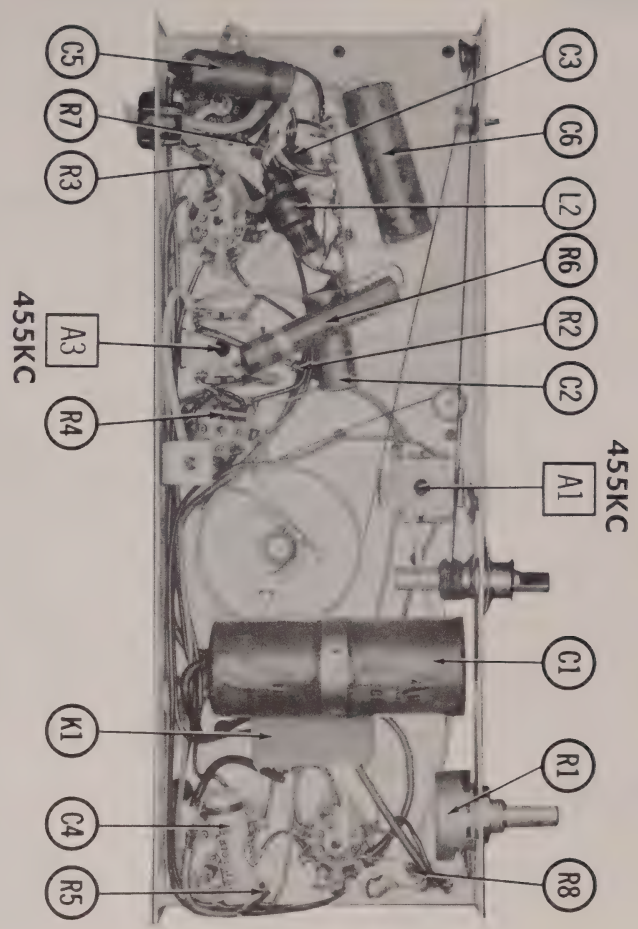
## WIRING DATA

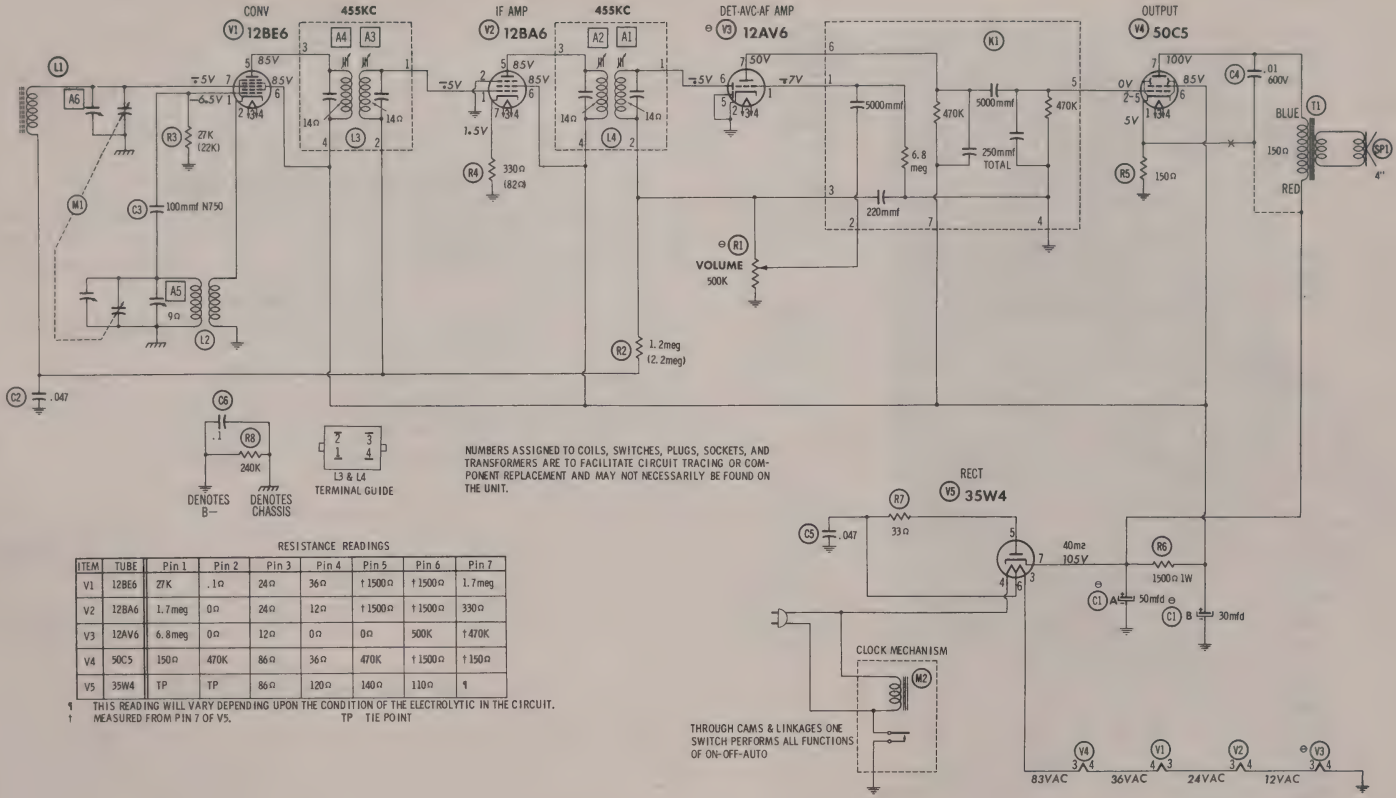
| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |

## DIAL CORD STRINGING




## CHASSIS—BOTTOM VIEW






NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12BE6 | 27K | .1Ω | 24Ω | 36Ω | †1500Ω | †1500Ω | 1.7meg |
| V2 | 12BA6 | 1.7meg | 0Ω | 24Ω | 12Ω | †1500Ω | †1500Ω | 330Ω |
| V3 | 12AV6 | 6.8meg | 0Ω | 12Ω | 0Ω | 0Ω | 500K | †470K |
| V4 | 50C5 | 150Ω | 470K | 86Ω | 36Ω | 470K | †1500Ω | †150Ω |
| V5 | 35W4 | TP | TP | 86Ω | 120Ω | 140Ω | 110Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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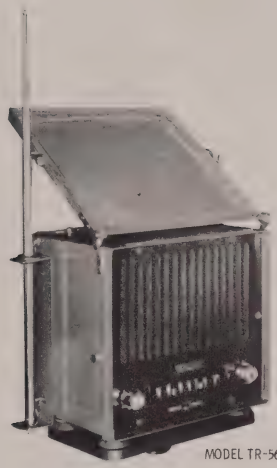
**AUTOMATIC**
**MODEL CL-75**

PHOTOFACT® Folder

**AUTOMATIC MODEL**
**TR-12B, TR-56**

AUTOMATIC MODEL
TR-12B, TR-56



MODEL TR-56

| | |
|---|---|
| TRADE NAME | Automatic Models TR-12B (6 Volt), TR-56 (12 Volt) |
| MANUFACTURER | Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass. |
| TYPE SET | Battery Operated 8 Tube Tractor AM Receiver |
| POWER SUPPLY | 6 (or) 12 Volt Storage Battery |
| RATING | 3.7 Amp. @ 12.6 Volts DC<br>1.9 Amp. @ 6.3 Volts DC |
| TUNING RANGE | BROADCAST 538-1610KC |

# ALIGNMENT INSTRUCTIONS

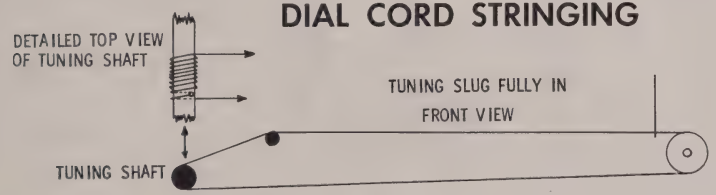
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6 ..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .01mfd to pin 7 (grid) of Converter. Low side to chassis. | 455KC (400∿ Mod.) | High frequency end stop | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. |
| 2. | High side thru 68mmf to antenna receptacle. Low side to chassis. | 1610KC | " | " | A5 | " |
| 3. | " | 1400KC | Tune to 1400KC signal | " | A6, A7 | " |
| 4. | With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output. | | | | | |

# DIAL CORD STRINGING

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JD803



SET 492 FOLDER 6

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | TYPE (CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA) |
|---|---|---|
| V1 | RF Amplifier | 12BA6 (6BA6) * |
| V2 | Converter | 12BE6 (6BE6) * |
| V3 | IF Amplifier | 12BA6 (6BA6) * |
| V4 | Det. - AVC - AF Amp. | 12AV6 (6AV6) * |
| V5 | AF Amplifier | 12AV6 (6AV6) * |
| V6 | Output | 12AQ5 (6AQ5) * |
| V7 | Output | 12AQ5 (6AQ5) * |
| V8 | Rectifier | 12X4 (6X4) * |

* Used in Model TR-12B

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | AUTOMATIC PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■20 | 350 | 20-86S | AFH3-107 | C0800 | FP329.5 | TMT-92 | TVL-3635 | |
| B | ▲20 | 350 | | | | | | | |
| C | 20 | 25 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA: AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C2 | 100 N750 | | N750-DI 100 | DTN-100 | C10T1U | CCTN-101 | CN7-310 | 10TCU-T10 |
| C3 | 5000 10% | | DI-5000 | | PM6D5 | CCD-502 | JL-250 | 10TS-D50 |
| C4 | | | | | | | | |
| C5 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C6 | 5 | | NPO-DI 5.0 | DTZ-4R7 | C10V5C | CCTO-4R7 | CNO-555 | 10TCC-V50 |
| C7 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | | 2TM-S47 |
| C8 | | | | | | | | |
| C9 | 40 NPO | | NPO-DI 39 | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C10 | | | | | | | | |
| C11 | 220 | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C12 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C13 | 220 | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C14 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C15 | 220 | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C16 | .02 400V | | P488N-02 | DD-203 | CUB4S2 | 4DP-2-203 | GEM-412 | 4TM-S2 |
| C17 | .02 400V | | P488N-02 | DD-203 | CUB4S2 | 4DP-2-203 | GEM-412 | 4TM-S2 |
| C18 | .005 600V | | P688N-005 | D6-502 | CUB6D5 | 6DP-1-502 | GEM-625 | 6TM-D5 |
| C19 | .007 1600V | | P1684CM-007 | DD16-702 | CUB16D7 | 16DP-3-702 | GEM-1627 | MB-D7 |
| C20 | .25 100V | Note 1 | P288N-25 | | CUB2P25 | 2DP-4-254 | GEM-2025 | 2TM-P25 |
| C21 | .47 100V | | P288N-47 | | CUB2P47 | 2DP-5-474 | GEM-2047 | 2TM-P47 |
| C22 | .47 100V | | P288N-47 | | CUB2P47 | 2DP-5-474 | GEM-2047 | 2TM-P47 |

Note 1. Not used in Model TR-12B.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA: AUTOMATIC PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | 80A974 | ABT-66 | A47F3-500K | B13-133X | UT-427 | Volume Note 1 |
| | 100K Tap | | | | | | | |
| B | Shaft | | | AK-8 | RS-3/16 | SK9 | DS-37 | |
| C | Switch | | | KR-4 | SWE-13 | 76-1 | US-26 | Power Off-On |

Note 1. Some versions may use 750K (Part #80-TR12).

## RESISTORS

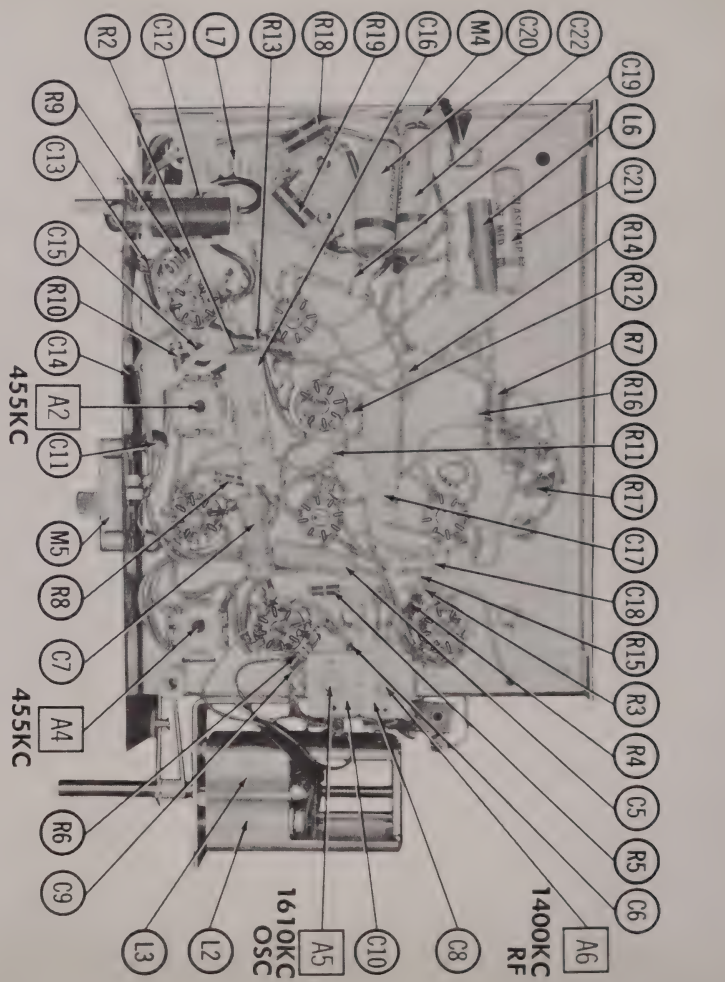
All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 2.2meg | |
| R3 | 470K | |
| R4 | 220Ω | |
| R5 | 150K | |
| R6 | 47K | |
| R7 | 6800Ω 2W | |
| R8 | 1500Ω | (2700Ω)* |
| R9 | 4.7meg | |
| R10 | 220K | (270K) * |
| R11 | 470K | |
| R12 | 47K | |
| R13 | 100K | (82K) * |
| R14 | 4700Ω 1W | |
| R15 | 470K | |
| R16 | 330Ω 1W | |
| R17 | 1000Ω 1W | |
| R18 | 220Ω 1W | (82Ω) † |
| R19 | 220Ω 1W | (82Ω) † |

* Alternate Value.

† Model TR-12B.

## CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | AUTOMATIC PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Antenna Coil | † | | | | | | † Part of M3 |
| L2 | RF Coil | † | | | | | | |
| L3 | Osc. Coil | † | | | | | | |
| L4 | 1st IF Trans. | 14-1655-6 | 16-6758 | 16-6758 | BC-352 | 12-C1 | RF-1 | |
| L5 | 2nd IF Trans. | 14-1655-6 | 16-6758 | 16-6758 | BC-353 | 12-C2 | RF-2 | |
| L6 | Hash Choke | 14-203 | | | | | | 10uh |
| L7 | A Lead Choke | 14-205 | | | | | | 1.2uh |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | AUTOMATIC PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 12V @ 1.6A | 430VCT @ .050A | | 76-555 ① | | | | | | |

① Part #76-100 used in Model TR-12B.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | AUTOMATIC PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 5200Ω CT | 3-4Ω | (Part of SP1) | 24S07 | A-2935 | AU-600 | A-3823 | 24S07 | S-53X | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | AUTOMATIC PART No. | QUAM PART No. | |
| SP1 | 6" x 9" | PM | 3-4Ω | 73-TR12 ① | 69A3 | ① Includes Output Transformer (T2). |

## VIBRATOR

| ITEM No. | TYPE | INPUT VOLTS | FREQUENCY | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | | | AUTOMATIC PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | RADIART PART No. | |
| M1 | Interrupter | 12.6 | 115~ | 113-55 | 6330 | G1602 | 6330 | Model TR-56 |
| | " | 6.3 | 115~ | 113-83 | 5715 | 1501 | 5715 | Model TR-12B |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AUTOMATIC PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M2 | SFE | 15A 32V | 108-201 | | 307015 (SFE 15A 32V) | 155009 | AGC15 | HHJ |

## MISCELLANEOUS

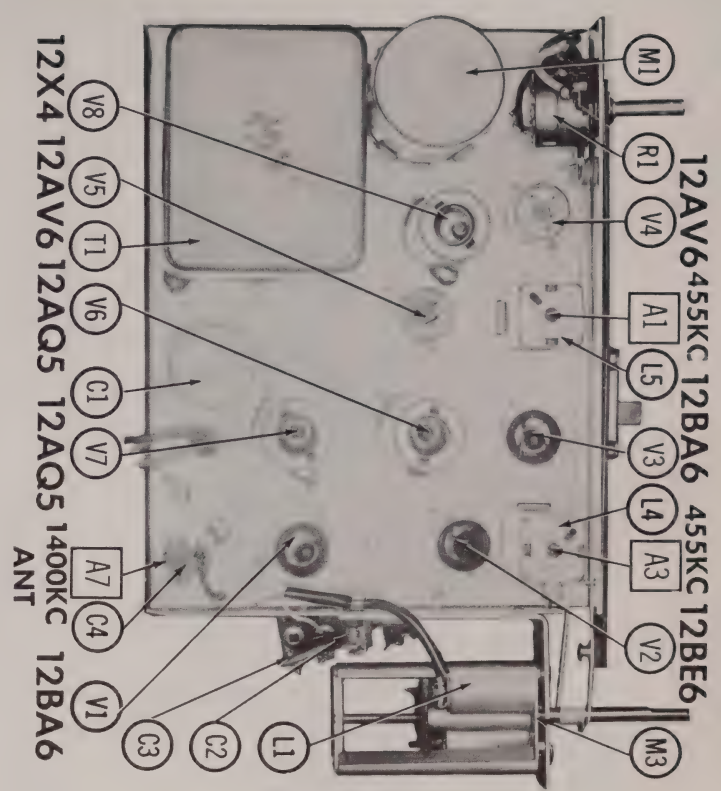
| ITEM No. | PART NAME | AUTOMATIC PART No. | NOTES |
|---|---|---|---|
| M3 | Tuner | 78-325-TR | Manual |
| M4 | Spark Plate | | |
| M5 | Switch | 45-SS-1 | Tone (SPDT Slide Type) |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

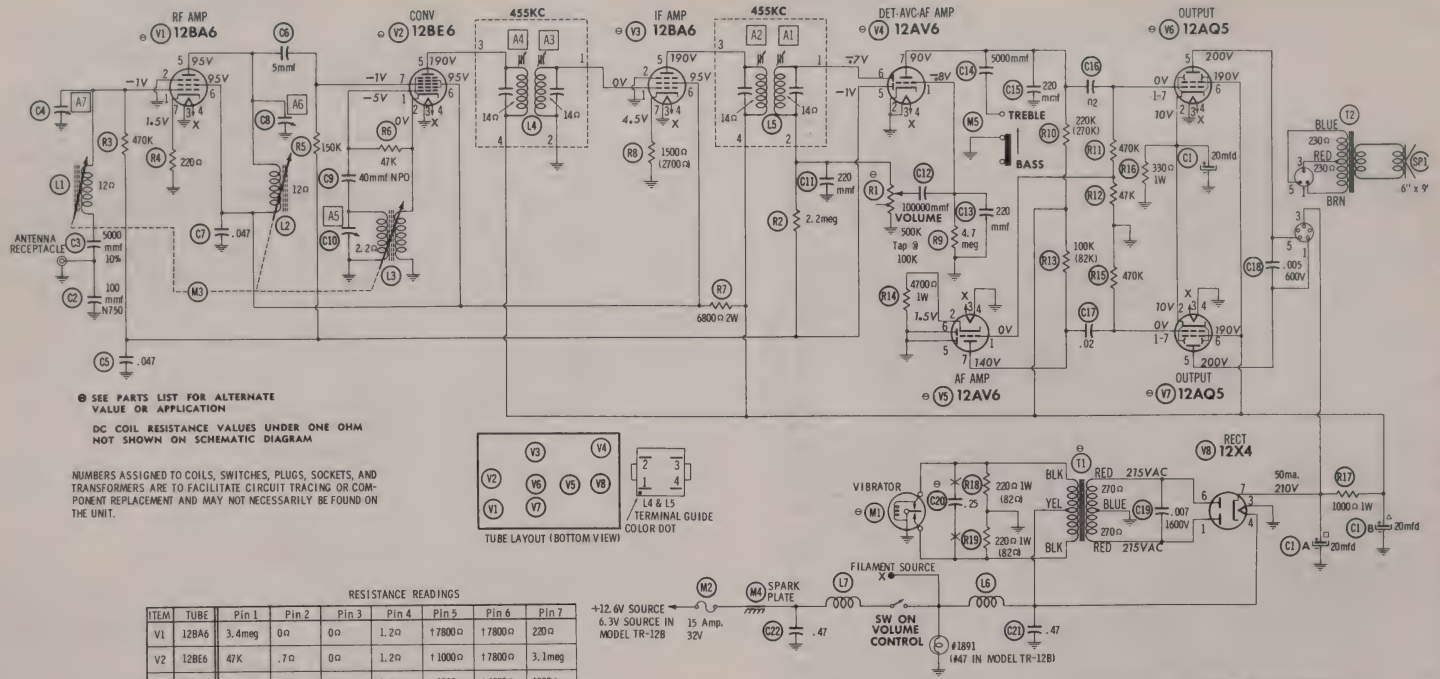
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 48A005-2 | Tuning |
| Knob | 48A005-1 | Volume |
| Dial Pointer | 84-100 | |
| Dial Scale | 39-TR12B | |

# CHASSIS—TOP VIEW




## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Shielded Hook-up Wire | Use BELDEN No. 8885 |
| Bonding Strap | Use BELDEN No. 8661 |




**⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION**

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12BA6 | 3.4meg | 0Ω | 0Ω | 1.2Ω | †7800Ω | †7800Ω | 220Ω |
| V2 | 12BE6 | 47K | .7Ω | 0Ω | 1.2Ω | †1000Ω | †7800Ω | 3.1meg |
| V3 | 12BA6 | 14Ω | 0Ω | 0Ω | 1.2Ω | †1000Ω | †6800Ω | 1500Ω |
| V4 | 12AV6 | 4.7meg | 0Ω | 0Ω | 1.2Ω | 2.9meg | 500K | †220K |
| V5 | 12AV6 | 47K | 4700Ω | 1.2Ω | 0Ω | 0Ω | 0Ω | †100K |
| V6 | 12AQ5 | 520K | 330Ω | 0Ω | 1.2Ω | †230Ω | †1000Ω | 520K |
| V7 | 12AQ5 | 470K | 330Ω | 0Ω | 1.2Ω | †230Ω | †1000Ω | 470K |
| V8 | 12X4 | 270Ω | NC | 0Ω | 1.2Ω | NC | 270Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V8.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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**AUTOMATIC MODEL TR-12B, TR-56**

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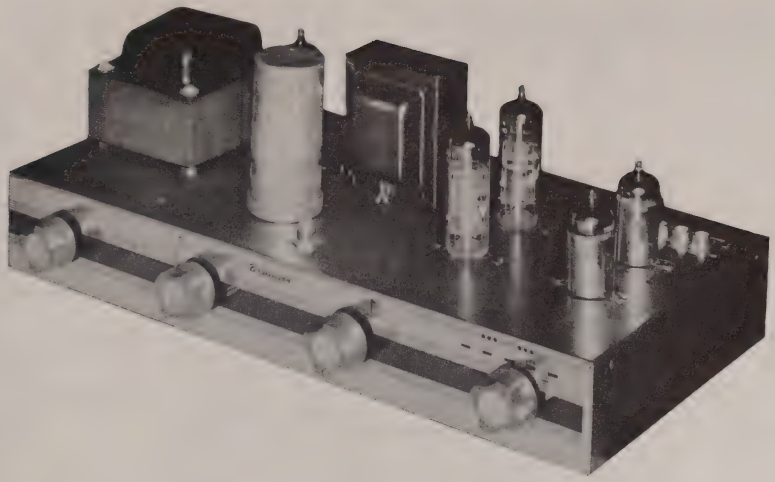
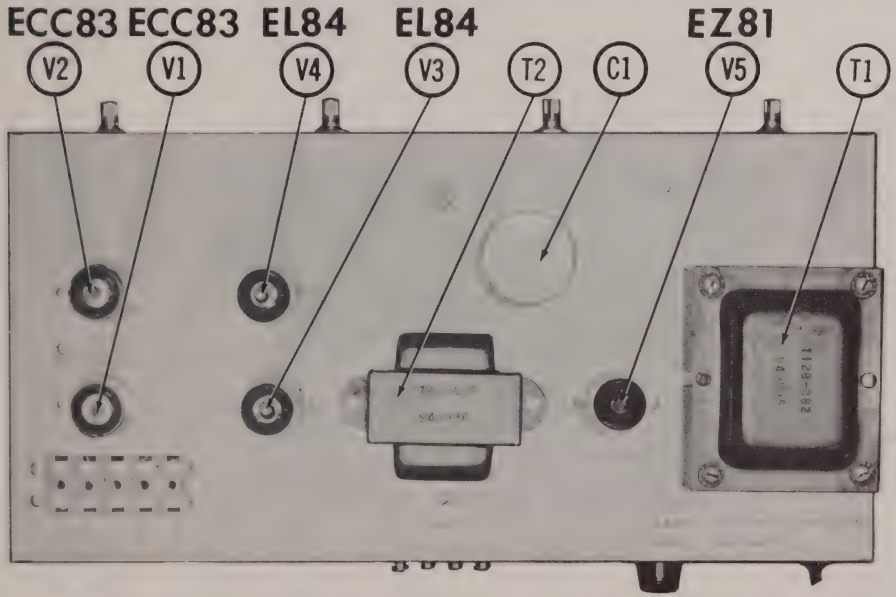
**BOULEVARD
MODEL 5T17**

BOULEVARD
MODEL 5T17



| | |
|---|---|
| TRADE NAME | Boulevard Model 5T17 |
| MANUFACTURER | Boulevard Electronics, Inc., 1229 W. Washington Blvd., Chicago 7, Illinois |
| TYPE SET | AC Operated 5 Tube Audio Amplifier |
| POWER SUPPLY | 100-130 Volts AC, 60 Cycles RATING 69 Watts, .68 Amp. @ 117 Volts AC |

BOULEVARD
MODEL 5T17

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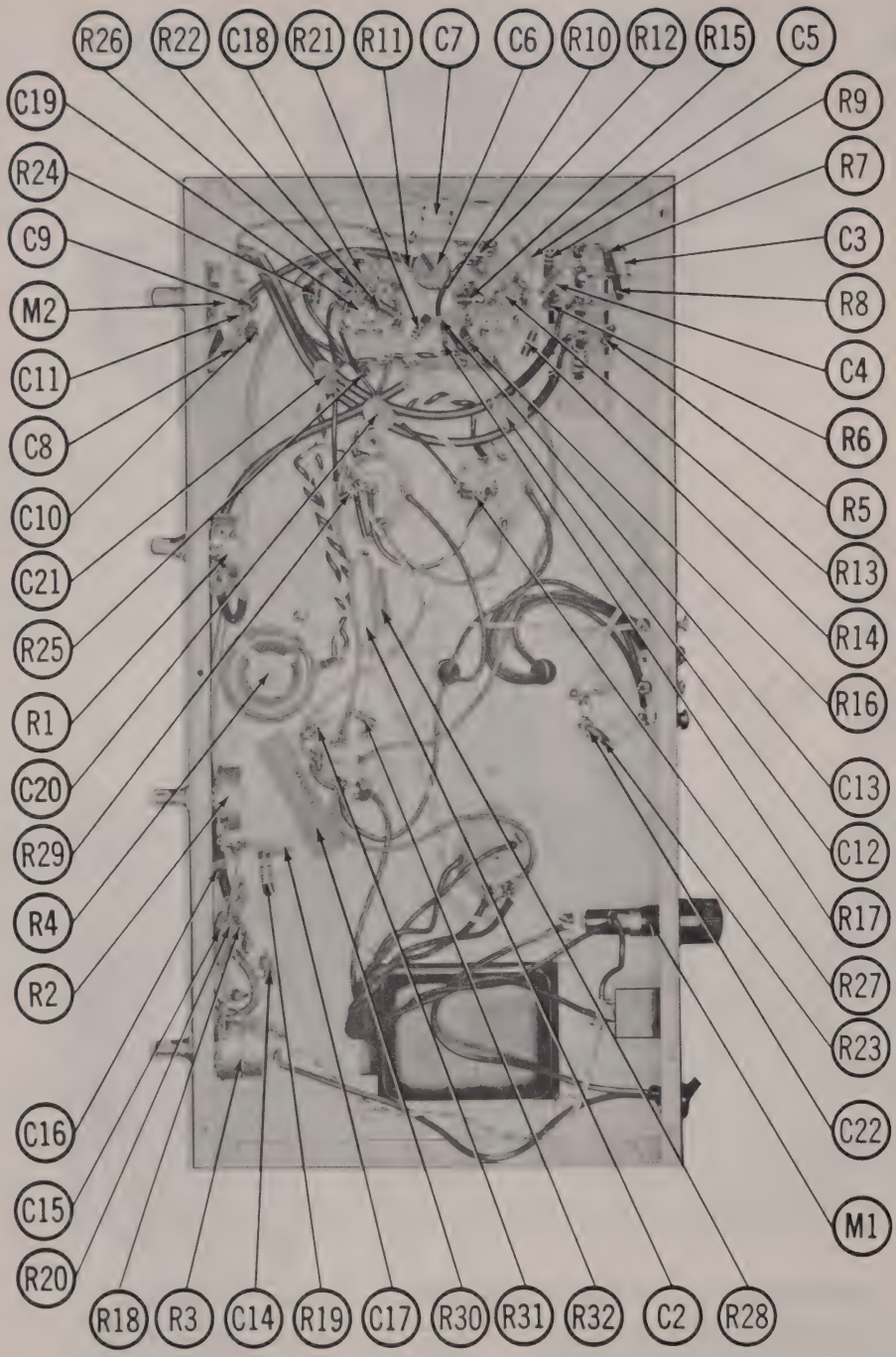



CHASSIS BOTTOM VIEW

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆ | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Preamplifier | ECC83/12AX7 | V4 | Output | EL84/6BQ5 |
| V2 | AF Amp. - Phase Inv. | ECC83/12AX7 | V5 | Rectifier | EZ81/6CA4 |
| V3 | Output | EL84/6BQ5 | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | BOULEVARD PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | ▲50 | 400 | | AFH4-18-40 | D0176 | FP447.5 | TMQ-119 | TVL-4674 | |
| B | ■40 | 350 | | | | | | | |
| C | ▲30 | 300 | | | | | | | |
| D | 30 | 300 | | | | | | | |
| C2 | 50 | 25 | | PRS1265 | BBR50-25 | TC29 | TD-50-25 | TVA-1206 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | EMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C3 | 47 N075 10% | | | | | | | |
| C4 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C6 | 4700 | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | B-247 | 5HK-D47 |
| C7 | 47 N075 10% | | | | | | | |
| C8 | 47 | | SI 47 | DD-470 | L10Q47 | CCD-470 | GP447 | 10TS-Q47 |
| C9 | 200 | | BPD-0002 | DD-201 | L10T2 | CCD-201 | GP320 | 10TS-T20 |
| C10 | 1000 | | SI 1000 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C11 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C12 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C13 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C14 | 100 | | SI 100 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C15 | .002 600V | | P688N-002 | D6-202 | CUB6D2 | 6DP-1-202 | GEM-622 | 6TM-D2 |
| C16 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C17 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C18 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C19 | 47 N075 10% | | | | | | | |
| C20 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C21 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C22 | 47 N075 10% | | | | | | | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | BOULEVARD PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | 972121-26 | B-70 | A47-1meg-Z | Q13-137 | U53 | Volume |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R2A | 1meg | ½ | BA811-2989 | B-69 | A47-1meg-S | Q11-137 | U54 | Bass |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R3A | 1meg | ½ | BA812-1278 | B-69 | A47-1meg-S | Q11-137 | U54 | Treble |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | |
| R4 | 125Ω | 2(WW) | | WN-101 AK-30 | | | | Hum Balance (Ground Lug) |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 470K | |
| R6 | 470K | |
| R7 | 2meg | |
| R8 | 1.2meg | |
| R9 | 47K | |
| R10 | 27K | |
| R11 | 120K | |
| R12 | 120K | |
| R13 | 4.7meg | |
| R14 | 220K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R15 | 12meg | |
| R16 | 470K | |
| R17 | 120K | |
| R18 | 120K | |
| R19 | 27K 1W | |
| R20 | 120K | |
| R21 | 470K | |
| R22 | 2200Ω | |
| R23 | 100K | |
| R24 | 12meg | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R25 | 56K | |
| R26 | 56K | |
| R27 | 470K | |
| R28 | 130Ω 4W | |
| R29 | 470K | |
| R30 | 1000Ω 10W | |
| R31 | 8200Ω | |
| R32 | 22K | |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | BOULEVARD PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V ⓐ .68A | 600VCT ⓐ .090A | 6.3V ⓐ 3.1A | 112B-382 | 22R04 ① | P-3052 ① | | | 22R04 ① | |

① Tape 5V winding.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | BOULEVARD PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 2500Ω CT | 16Ω Tap ⓐ 8Ω, 4Ω | 78B-420 | 22S66 ① | A-3027 | | A-3830 | 22S66 ① | | ① Drill new mounting holes. |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | BOULEVARD PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG | 5A 250V | | | 318005 (3AG 5A 250V) | 342001 | MTH5 | HKP |

## MISCELLANEOUS

| ITEM No. | PART NAME | BOULEVARD PART No. | NOTES |
|---|---|---|---|
| M2 | Switch | | Selector (Rotary Wafer Type) |

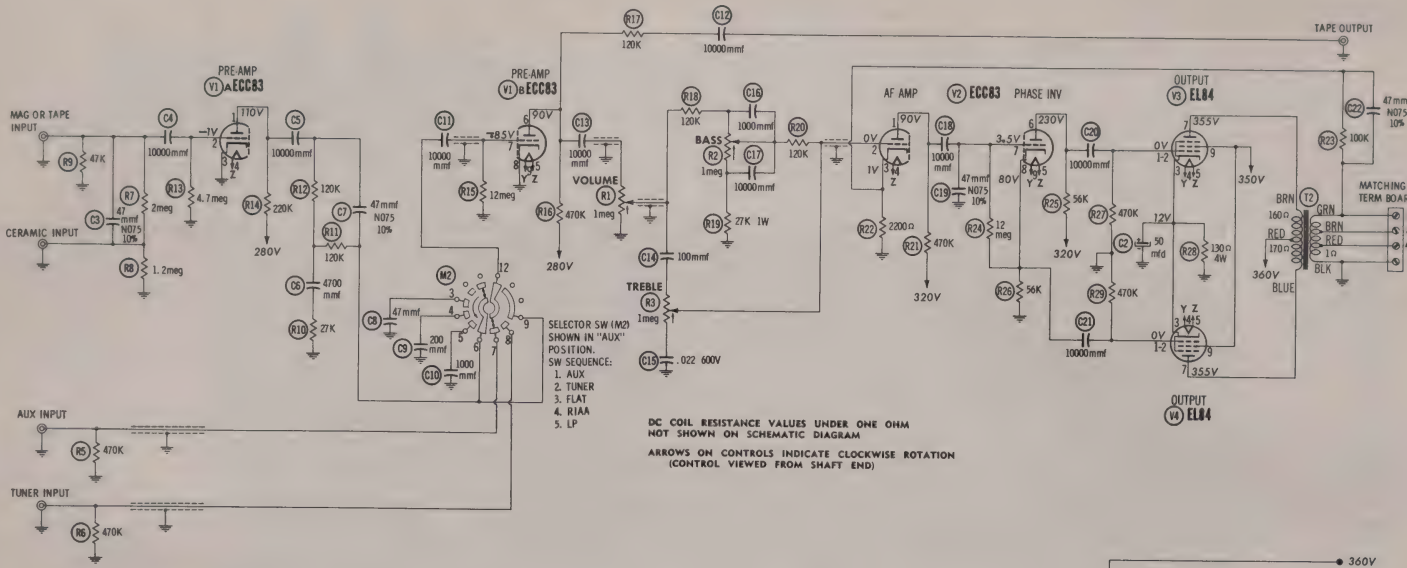
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

FOLDER 7

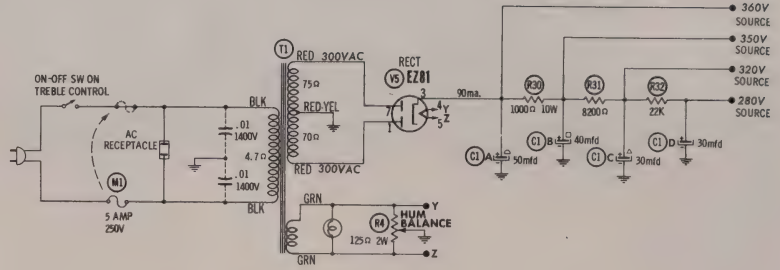
BOULEVARD MODEL 517




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | ECC83 12AX7 | †250K | 4.7meg | 0Ω | 20Ω | 20Ω | †500K | 12meg | 0Ω | 20Ω |
| V2 | ECC83 12AX7 | †480K | 150K | 2200Ω | 20Ω | 20Ω | †65K | 12meg | 56K | 20Ω |
| V3 | EL84 6BQ5 | 470K | 470K | 130Ω | 20Ω | 20Ω | NC | †160Ω | NC | †1000Ω |
| V4 | EL84 6BQ5 | 470K | 470K | 130Ω | 20Ω | 20Ω | NC | †170Ω | NC | †1000Ω |
| V5 | EZ81 6CA4 | 70Ω | NC | ¶ | 20Ω | 20Ω | NC | 75Ω | NC | NC |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V5. NC NO CONNECTION




1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**BOULEVARD MODEL 5T17**

PHOTOFACT® Folder

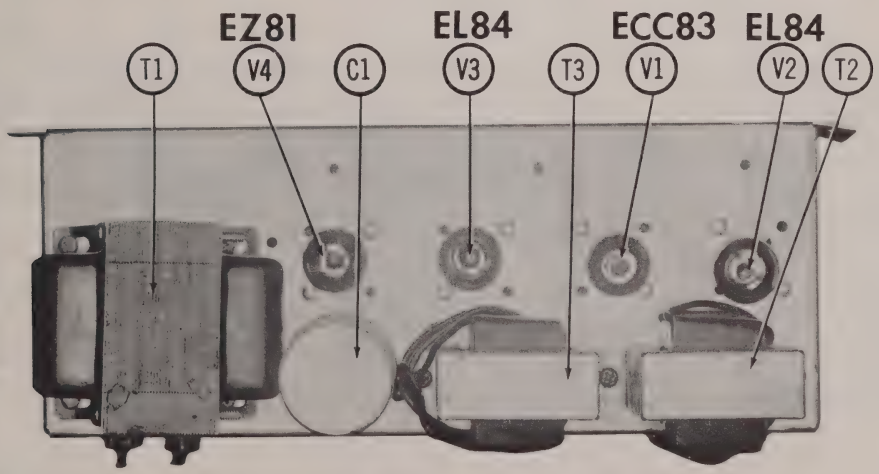
**CAPITOL
MODEL 932**

CAPITOL
MODEL 932

| | |
|---|---|
| TRADE NAME | Capitol Model 932 |
| MANUFACTURER | Capitol Records, Inc., 1 S. Webster Ave., Scranton 5, Pa. |
| TYPE SET | AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 56 Watts, .56 Amp @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER PART #1210B-495 - SEE V-M 1201
PHOTOFACT SET 436 FOLDER 18

CAPITOL
MODEL 932

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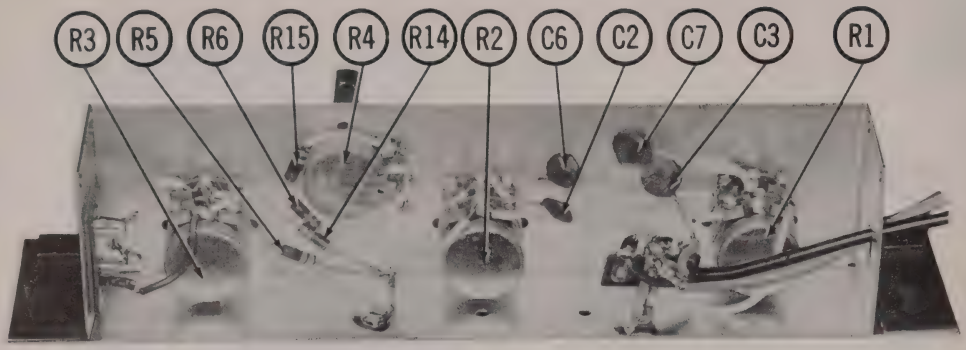
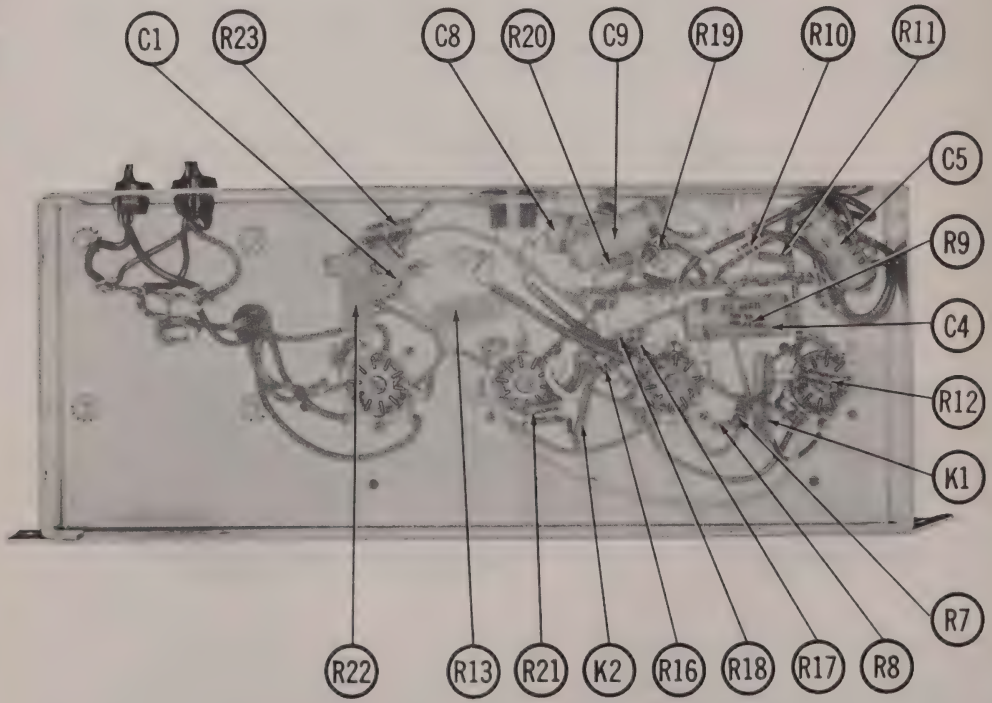
JT913



SET492 FOLDER 8




CONTROL PANEL-REAR VIEW




CHASSIS – BOTTOM VIEW

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1<br>V2 | Left Channel AF Amp - Right Channel AF Amp<br>Left Channel Output | ECC83/12AX7<br>EL84/6BQ5 | V3<br>V4 | Right Channel Output<br>Rectifier | EL84/6BQ5<br>EZ81/6CA4 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA CAPITOL PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲60 | 400 | ① | | D0674 | | TMQ-65 | TVL-4739 | |
| B | ■40 | 350 | | | BR505 | | TD-50-50 | TVA-1206 | |
| C | ▲40 | 300 | | | | | | | |
| D | 50 | 25 | | | | | | | |

① Some versions may use 60-40-20-50mfd ② 400-350-300-25 volts (Part #165-002)

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C2 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C3 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C4 | .25 200V | | P288N-25 | | CUB2P25 | 2DP-4-254 | GEM-2025 | 2TM-P25 |
| C5 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C6 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C7 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C8 | .25 200V | | P288N-25 | | CUB2P25 | 2DP-4-254 | GEM-2025 | 2TM-P25 |
| C9 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C10 | 1.5mfd 200V | | | | WMF2W1P5E | | | 118P1550S2 |
| C11 | 1.5mfd 200V | | | | WMF2W1P5E | | | 118P1550S2 |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA CAPITOL PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 3meg | | 133-801 | | | | | Loudness, Right Channel |
| B | 3meg | | | | | | | Loudness, Left Channel |
| R2A | 500K | | 133-625 | B-613 | | | | Treble, Right Channel |
| B | 500K | | | SR-613 | | | | Treble, Left Channel |
| R3A | 3meg | | 133-801 | | | | | Bass, Right Channel |
| B | 3meg | | | | | | | Bass, Left Channel |
| R4A | 3meg | | 132-800 | B-84 | A47-3meg-S | Q11-140 | U57 | Balance |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 100K | |
| R6 | 100K | |
| R7 | 6.8meg | |
| R8 | 680Ω | |
| R9 | 270Ω | |
| R10 | 82K | |
| R11 | 5600Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R12 | 1000Ω | |
| R13 | 82Ω 3W | |
| R14 | 100K | |
| R15 | 100K | |
| R16 | 6.8meg | |
| R17 | 680Ω | |
| R18 | 270Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R19 | 82K | |
| R20 | 5600Ω | |
| R21 | 1000Ω | |
| R22 | 270Ω 5W | |
| R23 | 1200Ω 1W | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | CAPITOL PART No. | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| K1 | Audio Coupling | 270mmf, 10000mmf, 270K, 470K | 195-001 | Aerovox<br>Centralab<br>Cornell-Dubilier<br>Sprague | PA-112-4<br>PC-81<br>113TM-2<br>T-2 |
| K2 | Audio Coupling | 270mmf, 10000mmf, 270K, 470K | 195-001 | Aerovox<br>Centralab<br>Cornell-Dubilier<br>Sprague | PA-112-4<br>PC-81<br>113TM-2<br>T-2 |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA CAPITOL PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ④<br>.56A | 500VCT④<br>.090A | 6.3V ④<br>2.9A | 200-001 | 24R31U ① | P-3148① | | PC-8420①② | 24R31U① | R-10A①② |

① Drill New Mounting Holes
② Tape 5V Winding and Center Tap on 6.3V Winding

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA CAPITOL PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 6800Ω | 3-4Ω | 205-004 | 26S48 | A-3020 | AU-600 | A-3823 | 26S48 | S-55Z | |
| T3 | 6800Ω | 3-4Ω | 205-004 | 26S48 | A-3020 | AU-600 | A-3823 | 26S48 | S-55Z | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA CAPITOL PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" x 9" | PM | 3-4Ω | 229-006 | 69A3 | |
| SP2 | 3½" | PM | 6-8Ω | 229-007 | 3A15TZ8 | |
| SP3 | 3½" | PM | 6-8Ω | 229-007 | 3A15TZ8 | |
| SP4 | 6" x 9" | PM | 3-4Ω | 229-006 | 69A3 | |
| SP5 | 3½" | PM | 6-8Ω | 229-007 | 3A15TZ8 | |
| SP6 | 3½" | PM | 6-8Ω | 229-007 | 3A15TZ8 | |

## PHONO CARTRIDGE

| ITEM No. | CAPITOL PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M1 | 13TX (Includes M2) | 13TX or 13T | Not Req. | 13 | Not Req. | A-44X or A-44XSD or A-44XDD | Not Req. | 10TB2-SD | Not Req. |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

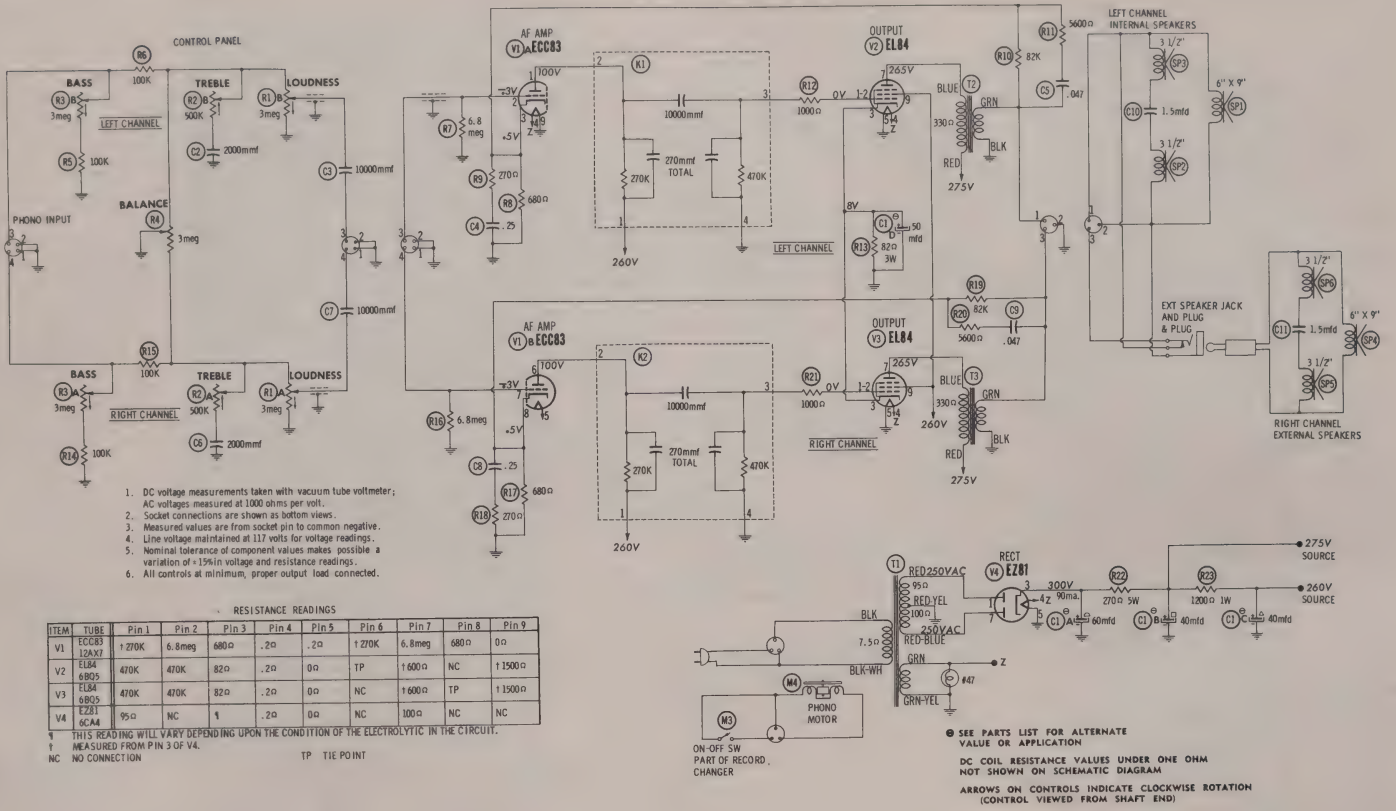
| ITEM No. | REPLACEMENT DATA CAPITOL PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M2 | (Part of M1) | *W-204DS † ♦ or *W-204DD-1 ♦ | *A-44X † or *A-44XSD †♦ or *A-44XDD ♦ | † Jewel ♦ Diamond *Includes Cartridge |

## MISCELLANEOUS

| ITEM No. | PART NAME | CAPITOL PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | | Power Off-On (Part of Changer) |
| M4 | Motor | | Phono Drive (Part of Changer) |

FOLDER 8

CAPITOL MODEL 932




1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | ECC83 12AX7 | †270K | 6.8meg | 680Ω | .2Ω | .2Ω | †270K | 6.8meg | 680Ω | 0Ω |
| V2 | EL84 6BQ5 | 470K | 470K | 82Ω | .2Ω | 0Ω | TP | †600Ω | NC | †1500Ω |
| V3 | EL84 6BQ5 | 470K | 470K | 82Ω | .2Ω | 0Ω | NC | †600Ω | TP | †1500Ω |
| V4 | EZ81 6CA4 | 95Ω | NC | ¶ | .2Ω | 0Ω | NC | 100Ω | NC | NC |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4.
NC NO CONNECTION
TP TIE POINT

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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**CAPITOL MODEL 932**

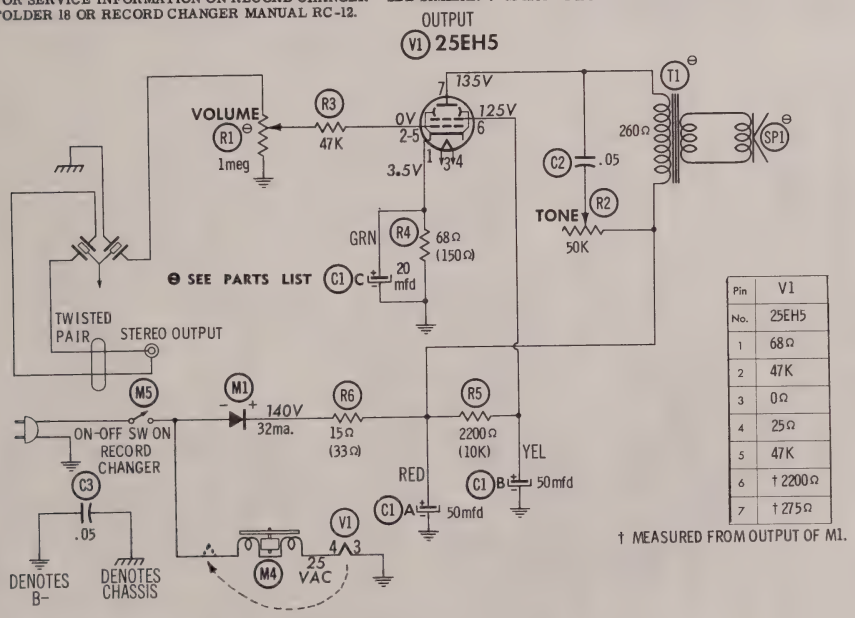
PHOTOFACT® Folder

# CORONADO MODEL PH20-4025A

CORONADO MODEL
PH20-4025A

| | |
|---|---|
| TRADE NAME | Coronado Model PH20-4025A |
| SUPPLIER | Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn. |
| TYPE SET | AC Operated One Tube Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 17 Watts, .15 Amp ④ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1201 - PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12.




| Pin No. | V1 |
|---|---|
| 1 | 68Ω |
| 2 | 47K |
| 3 | 0Ω |
| 4 | 25Ω |
| 5 | 47K |
| 6 | †2200Ω |
| 7 | †275Ω |

† MEASURED FROM OUTPUT OF M1.

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JS782



SET492 FOLDER 9

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## TUBES

| • CBS • | GENERAL ELECTRIC • | | RAYTHEON • | SYLVANIA • | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Output | 25EH5 | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA CORONADO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 50 | 150 | 42139 | PRS4575 | CO580 | TCT3119 | TDLT-18 | TVL-3430 | |
| B | 50 | 150 | | | | | | | |
| C | 20 | 25 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C2 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C3 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA CORONADO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1 | 1meg | Audio | V582 | | | | | Volume Note 1 |
| R2 | 50K | Audio | T585 | | | | | Tone |

Note 1: Some versions may use 500K in this application.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 47K | |
| R4 | 68Ω | (150Ω) * |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 2200Ω | (10K) * |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R6 | 15Ω | (33Ω) * |

* Alternate Value

## TRANSFORMER (AUDIO OUTPUT)

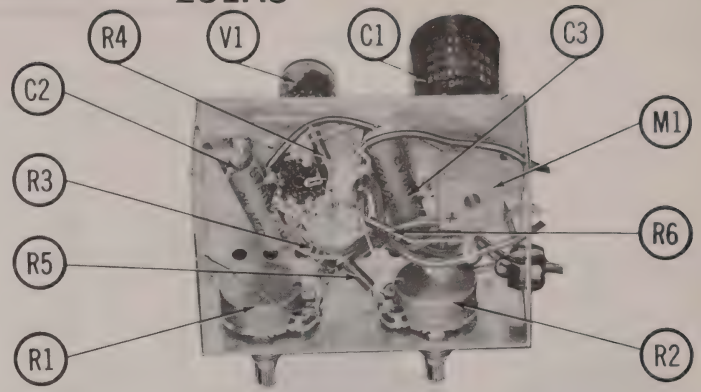
| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA CORONADO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 4000Ω | 3-4Ω | (Part of SP1) | 24S48 | A-3026 | | | 24S48 | S-6X | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA CORONADO PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 4" | PM | 3-4Ω | T451 * | 4A07 | * Includes T1 |

# CHASSIS—BOTTOM VIEW

25EH5




## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA CORONADO PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .032A | S65 M11 * | RS065 * | 1234AH * | 65A * | SR200♦ | * Selenium<br>♦ Silicon |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA CORONADO PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M2 | P-106 | | | 96 | | | | | |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA CORONADO * PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M3 | ST-075 † (LP) | | CRA-57X † or CRA-57XD †♦ | † Jewel ♦ Diamond |
| | ST-250 † (78RPM) | | CRA-57 † or CRA-57D ♦ | |

## MISCELLANEOUS

| ITEM No. | PART NAME | CORONADO PART No. | NOTES |
|---|---|---|---|
| M4 | Motor | | Phono Drive (Part of Changer) |
| M5 | Switch | | Off-On (Part of Changer) |

## CABINETS & CABINET PARTS

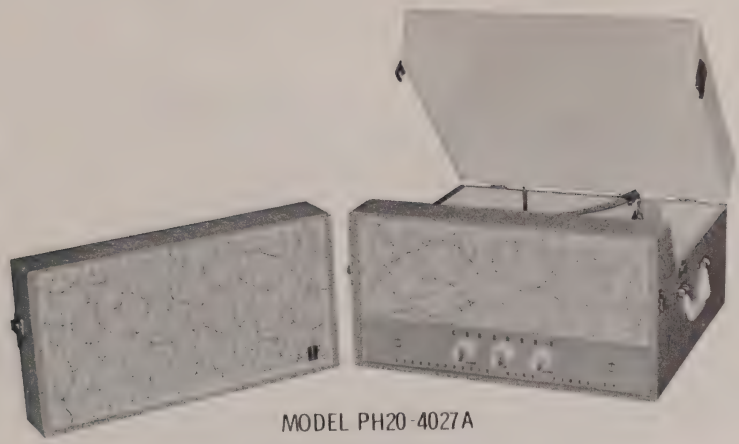
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 7500-1 | Volume, Tone |

PHOTOFACT® Folder

# CORONADO MODELS PH20-4026A, PH20-4027A

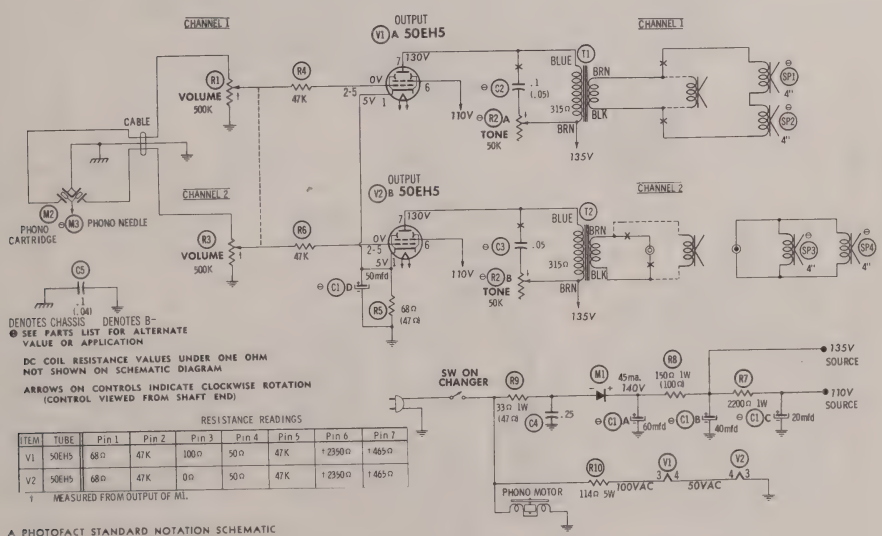
CORONADO MODELS
PH20-4026A, PH20-4027A



MODEL PH20-4027A

| | |
|---|---|
| TRADE NAME | Coronado Models PH20-4026A, PH20-4027A |
| SUPPLIER | Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn. |
| TYPE SET | AC Operated 2 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 26 Watts, .27 Amp. @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR V-M 1200A – PHOTOFACT SET 396 FOLDER 13 OR RECORD CHANGER MANUAL RC-11




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 50EH5 | 68Ω | 47K | 100Ω | 50Ω | 47K | †2350Ω | †465Ω |
| V2 | 50EH5 | 68Ω | 47K | 0Ω | 50Ω | 47K | †2350Ω | †465Ω |

† MEASURED FROM OUTPUT OF M1.

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JT812



SET492 FOLDER 10

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | Channel 1 Output | 50EH5 | V2 | Channel 2 Output | 50EH5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA CORONADO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 60 | 150 | 30-P-369 ① | PR4-450 | BBRT84215 | TCT3119 | TDLT-7 | TVAS-4528 * | |
| B | 40 | 150 | | | BBR50-25 | TC29 | TD-50-25 | | |
| C | 20 | 150 | | | | | | | |
| D | 50 | 25 | | | | | | | |

① Some versions may use Part No. 30-P-367.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C2 | .1 400V | (.05) * ① | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C3 | .05 400V | ① | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C4 | .25 400V | | P488N-25 | | CUB4P25 | 4DP-5-254 | GEM-4025 | 4TM-P25 |
| C5 | .1 400V | (.04) * | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |

* Alternate Value.
① Not used in some versions.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA CORONADO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1 | 500K | | V-582 | | | | | Volume, Channel 1 |
| R2A | 50K | | 31P164A | | | | | Tone, Channel 2. Note 1 |
| B | 50K | | | | | | | Tone, Channel 1. Note 1 |
| R3 | 500K | | V-582 | | | | | Volume, Channel 2 |

Note 1. Not used in some versions.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 47K | |
| R5 | 68Ω | (47Ω) * |
| R6 | 47K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R7 | 2200Ω 1W | |
| R8 | 150Ω 1W | (100Ω) * |
| R9 | 33Ω 1W | (47Ω) * |

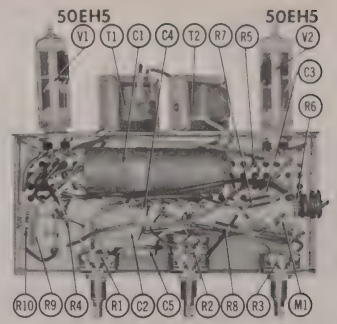
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 114Ω 5W | |

* Alternate Value.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA CORONADO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 4100Ω | 3-4Ω | 67P079-B | 24S48 | A-3026 | | | 24S48 | S-6X | |
| T2 | 4100Ω | 3-4Ω | 67P079-B | 24S48 | A-3026 | | | 24S48 | S-6X | |

# CHASSIS—BOTTOM VIEW




## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA CORONADO PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 4" | PM | 3-4Ω | MG-5923 * | 4A07 | * Model PH20-4027A |
| SP2 | 4" | PM | 3-4Ω | MG-5923 * | 4A07 | ♦ Model PH20-4026A |
| SP3 | 4" | PM | 6-8Ω | 5729 * | 4A07 | |
| SP4 | 4" | PM | 6-8Ω | 5729 * | 4A07 | |
| | 4" | PM | | S-1000A ♦ | | |
| | 3½" | PM | | M-584 ♦ | | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA CORONADO PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .045A | 2F4 | 2E4 | RE504 | K200 | SR200 | Silicon Type |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA CORONADO PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M2 | P-106 | | | 96 | | | | | |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA CORONADO PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M3 | ST-075 † (LP) | | CRA-57X † or CRA-57XD †♦ | † Jewel ♦ Diamond |
| | ST-250 † (78 RPM) | | CRA-57 † or CRA-57D ♦ | |

## CABINETS & CABINET PARTS

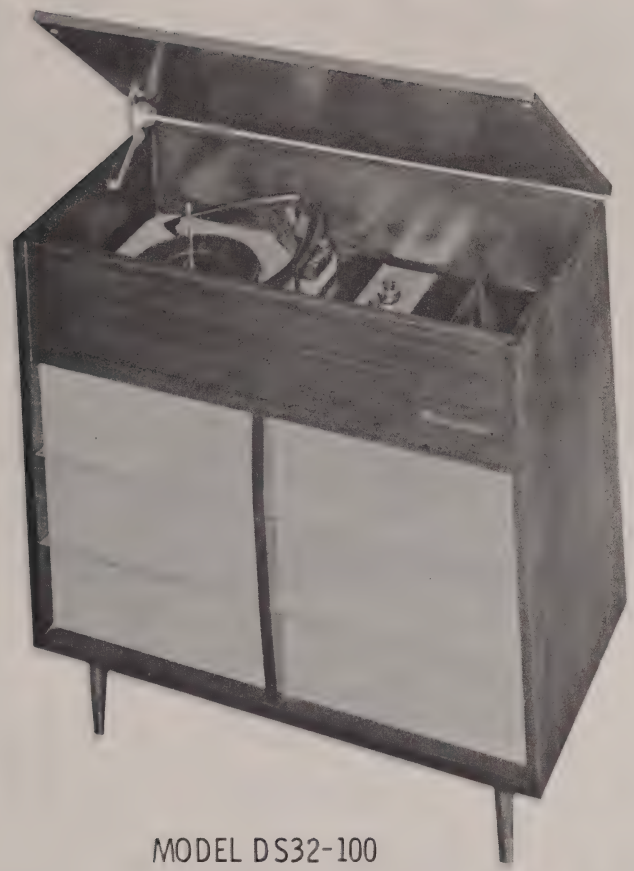
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 7500-1 | All Controls, Model PH20-4027A |
| Knob | 39P213-3 | Volume, Model PH20-4026A |

PHOTOFACT® Folder

# DYNAMIC MODELS DS32-100, ST-100, SX-24 (Ch. 100)

DYNAMIC MODELS DS32-100, ST-100, SX-24 (Ch. 100)



MODEL DS32-100

DYNAMIC MODELS DS32-100, ST-100, SX-24 (Ch. 100)

| | |
|---|---|
| TRADE NAME | Dynamic Models DS32-100, ST-100, SX-24 (Ch. 100) |
| MANUFACTURER | Dynamic Electronics - New York, Inc., 87-46 123rd Street, Richmond Hill 18, L. I., N. Y. |
| TYPE SET | AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 30 Watts, .32 Amp @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR WEBCOR 172- PHOTOFACT SET 447, FOLDER 13.

SET492 FOLDER 11

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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JT760

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Channel 1 AF Amp - Channel 2 AF Amp | 12AX7 | V2<br>V3 | Channel 1 Output<br>Channel 2 Output | 50C5<br>50C5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA DYNAMIC PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 150 | | PR4-800 | BBRT84215 | TCT3118 | TDLD-11 | TVA-3455 | |
| B | 80 | 150 | | | BBR20-150 | | TD-40-150 | | |
| C | 40 | 150 | | | | | | | |
| C2 | 100 | 25 | | SRE25V100 | BBR100-25 | TC2501 | ML100-25 | TE-1211 | |
| C3 | 4 | 25NP | | NP-PRS7405 | BBR8-150 † | TCN504 | | TVAS-1302.5* | |
| C4 | 4 | 25NP | | NP-PRS7405 | BBR8-150 † | TCN504 | | TVAS-1302.5* | |

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C5 | .1 | 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C6 | 2000 | | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C7 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C8 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C9 | 5000 | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D5 |
| C10 | 56 | N150 | | | | | * | | 10TCP-Q56 |
| C11 | 2000 | | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C12 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C13 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C14 | 5000 | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D5 |
| C15 | 56 | N150 | | | | | * | | 10TCP-Q56 |
| C16 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA DYNAMIC PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2meg | | CM23377 | | | | | Volume, Channel 2 |
| B | 2meg | | | | | | | Volume, Channel 1 |
| C | Shaft | | | | | | | |
| R2A | 50K | | CM23378 | B-31 | AD47-50K-S | | FB54L | Treble, Channel 2 |
| B | 50K | | | SR-31 | Not Req. | | RU54L | Treble, Channel 1 |
| C | Shaft | | | Not Req. | KSS-3 | | CS3500 | |
| R3A | 500K | | CM23379 | B-59 | AD47-500K-S | | FB55L | Bass, Channel 2 |
| B | 500K | | | SR-59 | Not Req. | | RU55L | Bass, Channel 1 |
| C | Shaft | | | Not Req. | KSS-3 | | CS3500 | |

## RESISTORS

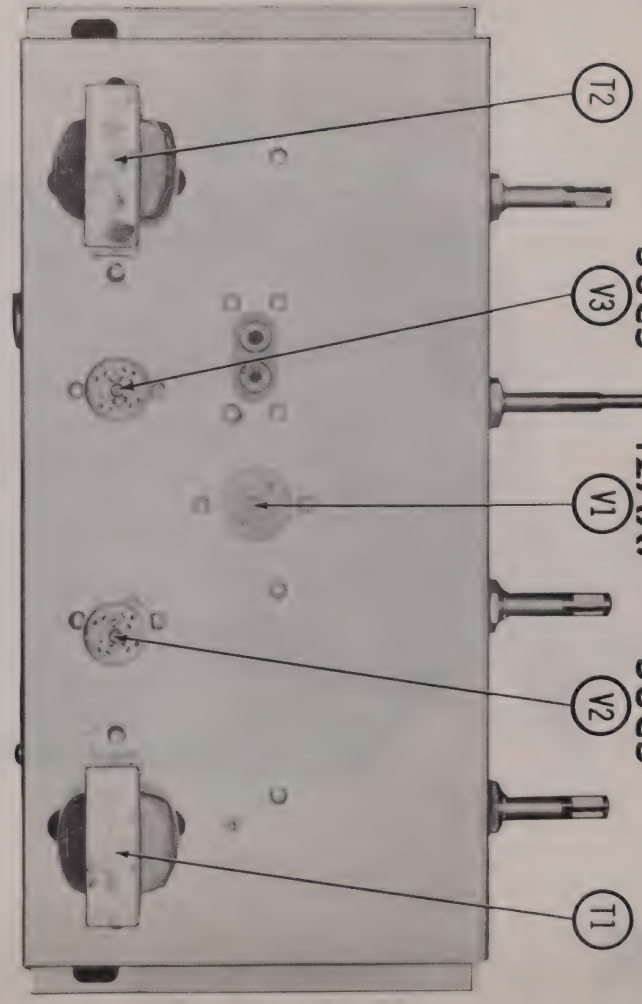
All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 3300Ω | |
| R5 | 220K | |
| R6 | 22K | |
| R7 | 470K | |
| R8 | 100Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 3300Ω | |
| R10 | 220K | |
| R11 | 22K | |
| R12 | 470K | |
| R13 | 3300Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R14 | 82Ω 2W | |
| R15 | 33Ω 2W | |
| R16 | 82Ω 2W | |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA DYNAMIC PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 5300Ω | 3-4Ω | OT-135 | | | | | | | |
| | | SEC. 2 | | | | | | | | |
| | | 210Ω | | | | | | | | |
| | PRI | SEC. 1 | | | | | | | | |
| T2 | 5300Ω | 3-4Ω | OT-135 | | | | | | | |
| | | SEC. 2 | | | | | | | | |
| | | 210Ω | | | | | | | | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA DYNAMIC PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 8" | PM | 3-4Ω | P/N8RZ | 8A1 | |
| SP2 | 3½" | PM | 4-6Ω | | 4A0TT | |
| SP3 | 3½" | PM | 4-6Ω | | 4A0TT | |
| SP4 | 8" | PM | 3-4Ω | P/N8RZ | 8A1 | |
| SP5 | 3½" | PM | 4-6Ω | | 4A0TT | |
| SP6 | 3½" | PM | 4-6Ω | | 4A0TT | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA DYNAMIC PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .080A | ♦ | ♦ T100 | ♦1235AH | ♦ 100A | *SR200 | ♦Selenium<br>* Silicon |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA DYNAMIC PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M2 | | 13T | | 13 | | | | 10T2-S | |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA DYNAMIC PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M3 | | * W-204SD † ♦ or<br>*W-204DD-1 ♦ | * A-44X † or<br>* A-44XSD † ♦ or<br>* A-44XDD ♦ | † Jewel ♦ Diamond<br>* Includes Cartridge |

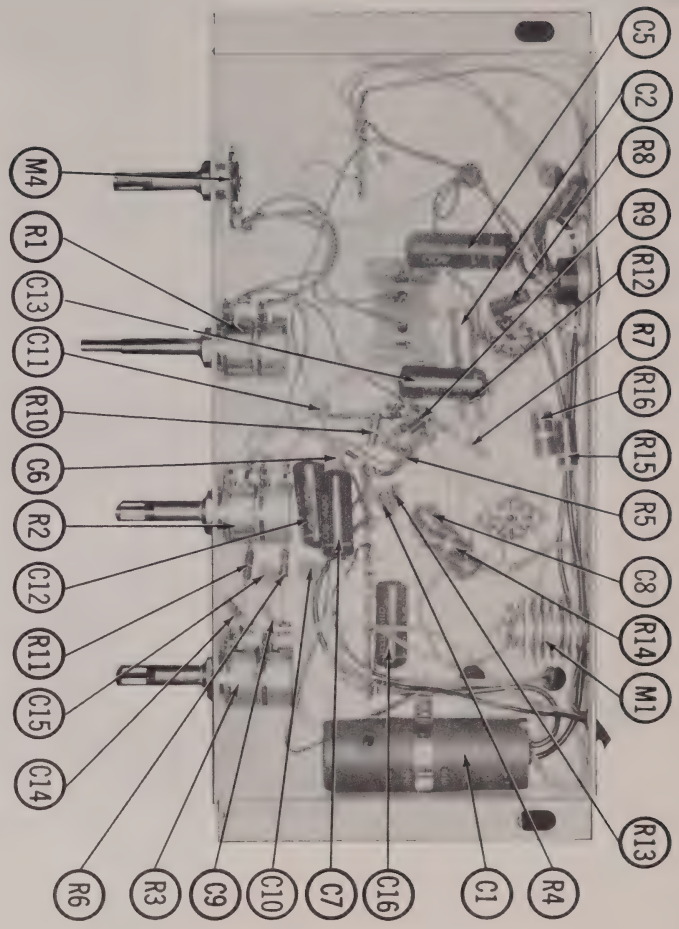
## MISCELLANEOUS

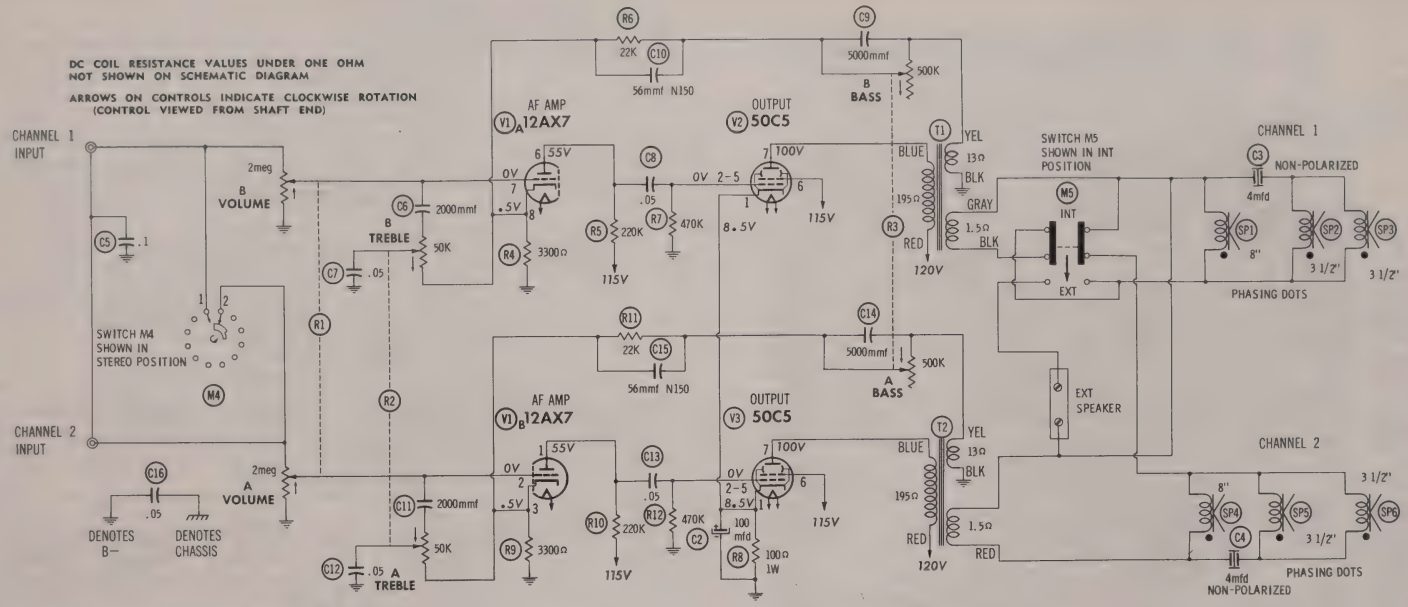
| ITEM No. | PART NAME | DYNAMIC PART No. | NOTES |
|---|---|---|---|
| M4 | Switch | | Selector |
| M5 | Switch | | Speaker (DPDT, Slide Type) |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## CHASSIS—BOTTOM VIEW

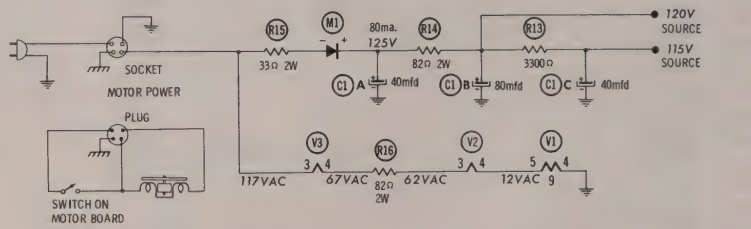





RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †220K | 0Ω | 3300Ω | 0Ω | 12Ω | †220K | 0Ω | 3300Ω | 6Ω |
| V2 | 50C5 | 100Ω | 470K | 62Ω | 12Ω | 470K | †3400Ω | †275Ω | | |
| V3 | 50C5 | 100Ω | 470K | 195Ω | 145Ω | 470K | †3400Ω | †275Ω | | |

† MEASURED FROM OUTPUT OF M1.




1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**DYNAMIC MODELS DS32-100, ST-100, SX-24 (Ch. 100)**

PHOTOFACT® Folder

**EICO MODELS
HF-22, HF-35**

EICO MODELS
HF-22, HF-35

MODEL HF-22

EICO MODELS
HF-22, HF-35

| | | | |
|---|---|---|---|
| TRADE NAME | Eico Models HF-22, HF-35 | | |
| MANUFACTURER | Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N. Y. | | |
| TYPE SET | AC Operated 5 Tube Audio Amplifier | | |
| POWER SUPPLY | 110 - 120 Volts AC, 60 Cycles | RATING | 100 Watts, .9 Amp. @117 Volts AC (Model HF-22)<br>130 Watts, 1.45 Amp. @117 Volts AC (Model HF-35) |

SET492 FOLDER 12

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DATE 7-60 SET492 FOLDER 12

SET492 FOLDER 12

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | AF Amp. | EF86/6267 | V4 | Output | 6L6GB |
| V2 | AF Amp. | 6SN7GTB | V5 | Rectifier | 5U4GB (GZ34) * |
| V3 | Output | 6L6GB | | | |

* Used in Model HF-35.

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA EICO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■20 | 450 | 24001① | AFH2-51 | B0400 | FP234 | TMD-50 | TVL-2755 | |
| B | ▲20 | 450 | | | | | | | |
| C2A | ■20 | 450 | 24001① | AFH2-51 | B0400 | FP234 | TMD-50 | TVL-2755 | |
| B | ▲20 | 450 | | | | | | | |
| C3 | 50 | 25 | 23007 | SRE25V50 | BBR50-25 | TC29 | TD-50-25 | TE-1209 | |
| C4 | 50 | 50 | 23011 | PRS1350 | BR505 | TC39 | TD-50-50 | TVA-1308 | |

① Model HF-35 uses Part #24007.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C5 | .05 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C6 | 47 10% | Note 1 | DI-47 | DD-470 | L10Q47 | CCD-470 | GP447 | 10TS-Q47 |
| C7 | .25 400V 10% | | V84C4P25-10% | | PM4P25 | 4DP-5-254 | GEM-4025 | 4TM-P25 |
| C8 | .1 400V 10% | | V84C4P1-10% | | PM4P1 | 4DP-3-104 | | 4TM-P1 |
| C9 | .1 400V 10% | | V84C4P1-10% | | PM4P1 | 4DP-3-104 | | 4TM-P1 |
| C10 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C11 | 850 10% | Note 2 | DI-820 | DD-821 | 1R5T85 | CCD-821 | GP382 | 10TS-T82 |
| C12 | 500 10% | Note 3 | DI-500 | DD-501 | 5R5T5 | CCD-501 | GP350 | 10TS-T50 |
| C13 | .03 600V | | P688N-03 | DD-303 | CUB6S5 | 6DP-3-303 | GEM-613 | 6TM-S3 |

Note 1. Model HF-35 uses 100mmf in this application.
Note 2. Model HF-35 uses 1500mmf in this application.
Note 3. Model HF-35 uses 175mmf in this application.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA EICO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1meg | ½ | 16016 | AB-70 | A47-1meg-Z | B13-137 | U53 | Audio Level |
| B | Shaft | | | AK-1 | FKS-1/4 | SK2 | Not Req. | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

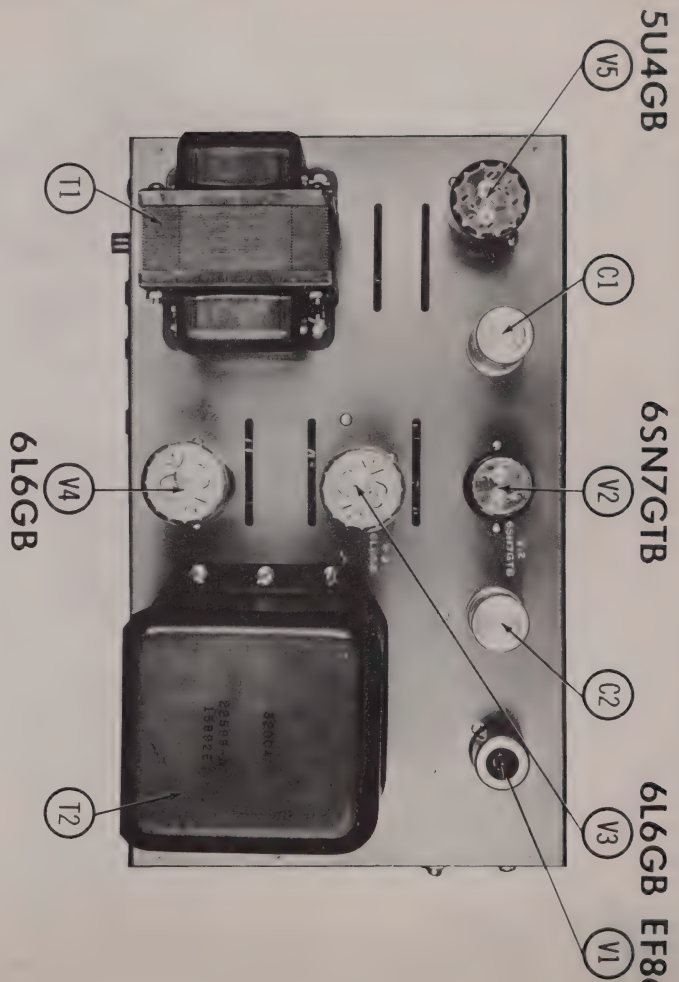
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 10K | |
| R3 | 100K 5% | |
| R4 | 15K | |
| R5 | 470K 5% | |
| R6 | 1138Ω 5% | |
| R7 | 100Ω 5% | |
| R8 | 220K | Note 1 |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 1meg | |
| R10 | 27K 5% 1W | (28.75K) * |
| R11 | 33K 5% 1W | |
| R12 | 10K 1W | Note 2 |
| R13 | 18K 5% 1W | |
| R14 | 1000Ω | |
| R15 | 120K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R16 | 1000Ω | |
| R17 | 120K | |
| R18 | 350Ω 10W | Note 4 |
| R19 | 1800Ω 5% | Note 3 |
| R20 | 1800Ω 5% | Note 3 |
| R21 | 10K 1W | Note 2 |

Note 1. Model HF-35 uses 270K in this application.
Note 2. Model HF-35 uses 15K in this application.
Note 3. Model HF-35 uses 3000Ω in this application.
Note 4. Model HF-35 uses 235Ω in this application.
* Alternate Value.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | EICO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| | PRI. | SEC. 1 | SEC. 2 | | | | | | | |
| T1 | 117V@ .9A | 750 VC T @ .100A | 5V@3V | 30016 ① | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V@ 2.7A | | | | | | | | | |

① Used in Model HF-22.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | EICO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| | PRI. | SEC. 1 | SEC. 2 | | | | | | | |
| T1 | 125V@ 1.15A Tap @ 117A 1.45A | 780VCT@ .140A Tap @ 75V@ .005A | 5V@ 1.9A | 30020② | 24R38③ | | | P-4004③ | 24R38③ | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V@ 4.2A | | | | | | | | | |

② Model HF-35
③ Parallel and phase 6.3 Volt windings. Tape center tap on 5V and 6.3V windings.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | EICO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| | PRI. | SEC. | | | | | | | | |
| T2 | 7500Ω CT Tap@ 1500Ω CT | 16Ω Tap@ 8Ω, 4Ω | 30004 | | | | | | | |

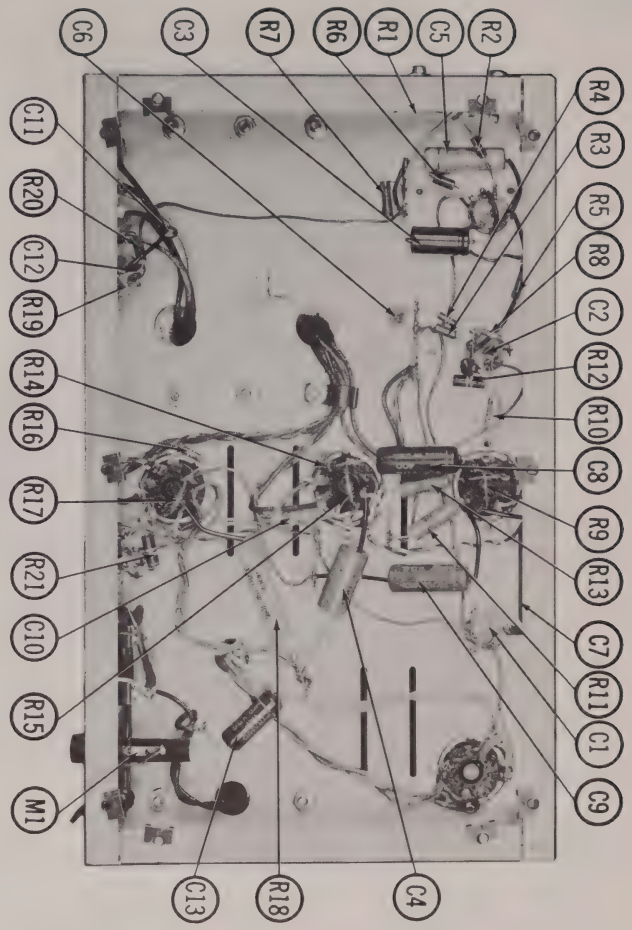
## FUSES

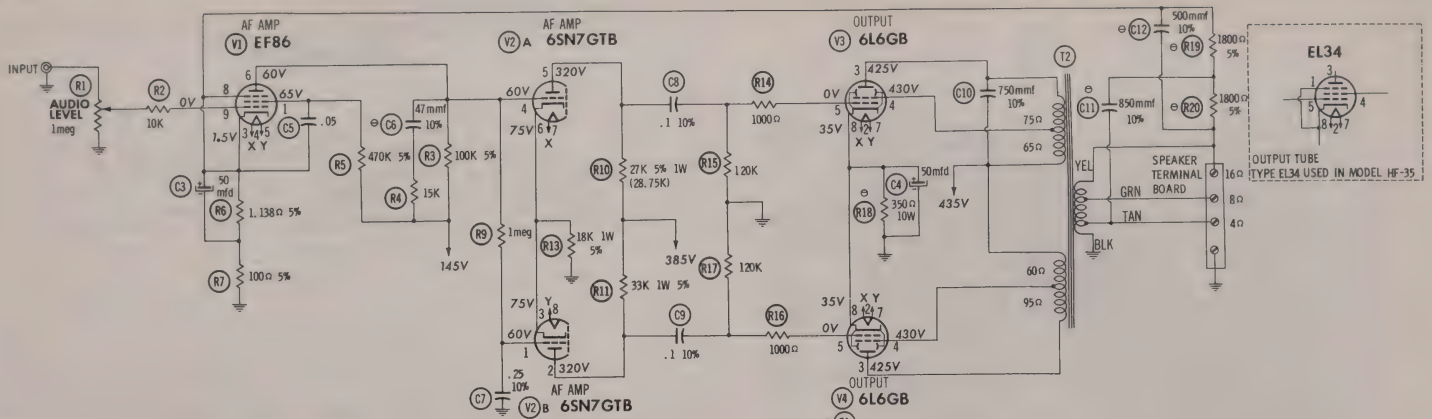
| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | EICO PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG | 3A 250V | 91005 | 97800 | 312003 (3AG 3A 250V) | 342001 | AGC3 | HKP |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |

## CHASSIS—BOTTOM VIEW






RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | EF86 6267 | †700K | 0Ω | 1200Ω | INF | INF | †330K | 0Ω | 1200Ω | 10K |
| V2 | 6SN7GTB | †1.3meg | †43K | 18K | †330K | †37K | 18K | INF | INF | |
| V3 | 6L6GB | 0Ω | INF | †140Ω | †65Ω | 120K | TP | INF | 350Ω | |
| V4 | 6L6GB | 0Ω | INF | †155Ω | †60Ω | 120K | TP | INF | 350Ω | |
| V5 | 5U4GB | NC | ¶ | NC | 70Ω | NC | 75Ω | NC | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**EICO MODELS HF-22, HF-35**

PHOTOFACT® Folder with CIRCUITRACE™

**MOTOROLA MODELS A2G, N, P, W, C1N, W, C2B, P, W, C3G, -1, C3S, -1, C3W, -1 (Ch. HS-745, HS-749, HS-750)**

MOTOROLA MODELS A2G, N, P, W, C1N, W, C2B, P, W, C3G, -1, C3S, -1, C3W, -1 (Ch. HS-745, HS-749, HS-750)

MODEL C3S-1

MOTOROLA MODELS A2G, N, P, W, C1N, W, C2B, P, W, C3G, -1, C3S, -1, C3W, -1 (Ch. HS-745, HS-749, HS-750)

| | |
|---|---|
| TRADE NAME | Motorola Models A2G, A2N, A2P, A2W (Ch. HS-745); C1N, C1W, C2B, C2P, C2W (Ch. HS-749); C3G, C3G-1, C3S, C3S-1, C3W, C3W-1 (Ch. HS-750) |
| MANUFACTURER | Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois |
| TYPE SET | AC Operated 5 Tube AM Receiver. "C" Series include electric clock. (C2 Series have Automatic Shut-Off, C3 Series Have Delayed Shut-Off and Repeating Alarm) |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 26 Watts, .25 Amp. @ 117 Volts AC (Less Clock) |
| TUNING RANGE—BROADCAST | 535 - 1620KC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .1mfd to pin 7 (grid) of Converter. Low side to B-. | 455KC (400~ Mod.) | Tuning gang fully open. | Across voice coil. | A1, A2, A3, A4 | Adjust for maximum output. |
| 2. | " | 1620KC | " | " | A5 | " |

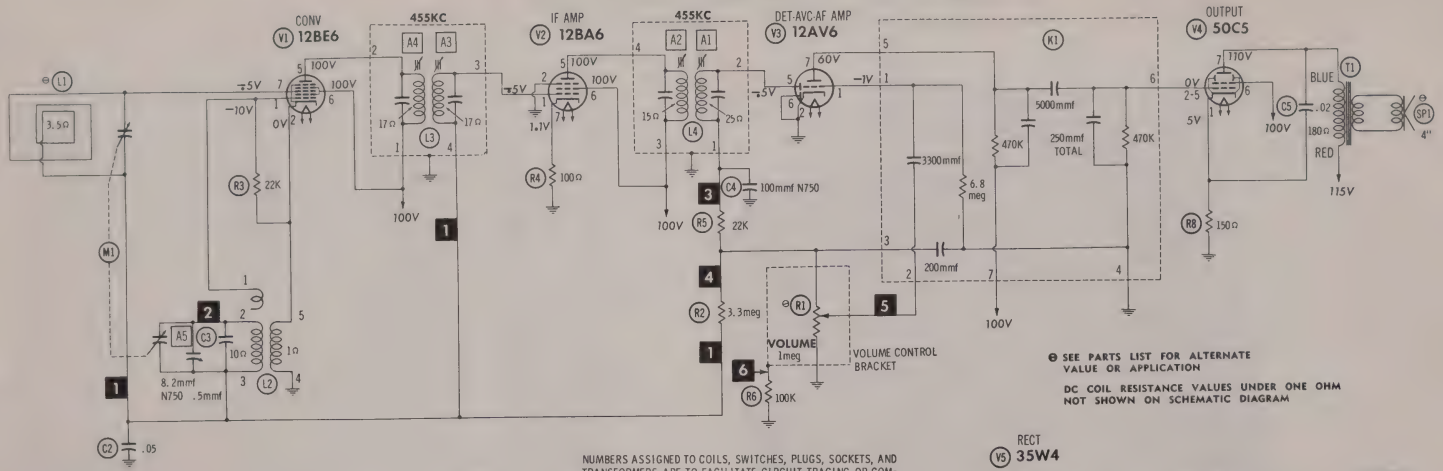
**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KG037

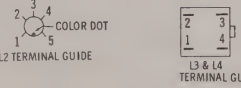


SET 492 FOLDER 13

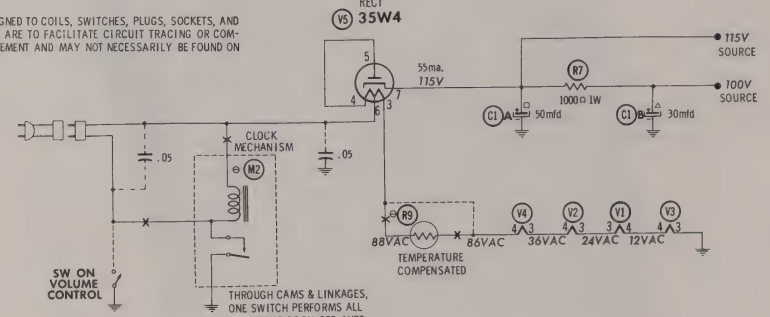



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM




NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12BE6 | 22K | 1Ω | 24Ω | 12Ω | ↑1000Ω | ↑1000Ω | 4.3meg |
| V2 | 12BA6 | 4.3meg | 0Ω | 24Ω | 36Ω | ↑1000Ω | ↑1000Ω | 100Ω |
| V3 | 12AV6 | 6.8meg | 0Ω | 0Ω | 12Ω | 1meg | 0Ω | ↑470K |
| V4 | 50C5 | 150Ω | 470K | 36Ω | 86Ω | 470K | ↑1000Ω | ↑180Ω |
| V5 | 35W4 | NC | TP | 86Ω | 120Ω | 120Ω | 115Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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**MOTOROLA MODELS A2G, N, P, W, C1N, W, C2B, P, W, C3G, -1, C3S, -1, C3W, -1 (Ch. HS-745, HS-749, HS-750)**

# PARTS LIST AND DESCRIPTIONS

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Converter | 12BE6 |
| V2 | IF Amplifier | 12BA6 |
| V3 | Det.-AVC-AF Amp | 12AV6 |
| V4 | Output | 50C5 |
| V5 | Rectifier | 35W4 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■50 | 150 | 23B632015 | PWH2-15-05 | B0150 ‡ | PWP213.1 | | PCL-2432 | |
| B | ▲30 | 150 | | | | | | | |

‡ Use printed circuit adapters #55277 & 55278.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C2 | .05 400V | #21K129671 | P488N-05 | DD-503 | CUB4S5 C10V82U | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C3 | 8.2 N750 ±.5mmf | | | | | | | |
| C4 | 100 N750 | | N750-DI 100 | DTN-100 | C10T1U | CCTN-101 | CN7-310 | 10TCU-T10 |
| C5 | .02 400V | | P488N-02 | DD-203 | CUB4S2 | 4DP-2-203 | GEM-412 | 4TM-S2 |

# Motorola Part Number.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA MOTOROLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1 | 1meg | ½ | 18B643869 | | | | | Volume Note 1 |

Note 1. A2 Series uses 1meg Volume with switch (Part #18B643863).

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 3.3meg | |
| R3 | 22K | |
| R4 | 100Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 22K | |
| R6 | 100K | |
| R7 | 1000Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R8 | 150Ω | |
| R9 | Note 1 | #6B643916 |

# Motorola Part Number.
Note 1. Temperature Compensating: 275Ω Cold, 48Ω Hot. Not used in Models C1 or C2 Series.

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | MOTOROLA PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Audio Coupling | 200mmf, 250mmf, 3300mmf, 5000mmf, 470K, 470K, 6.8meg | 51B643849 | |

## COILS (RF-IF)

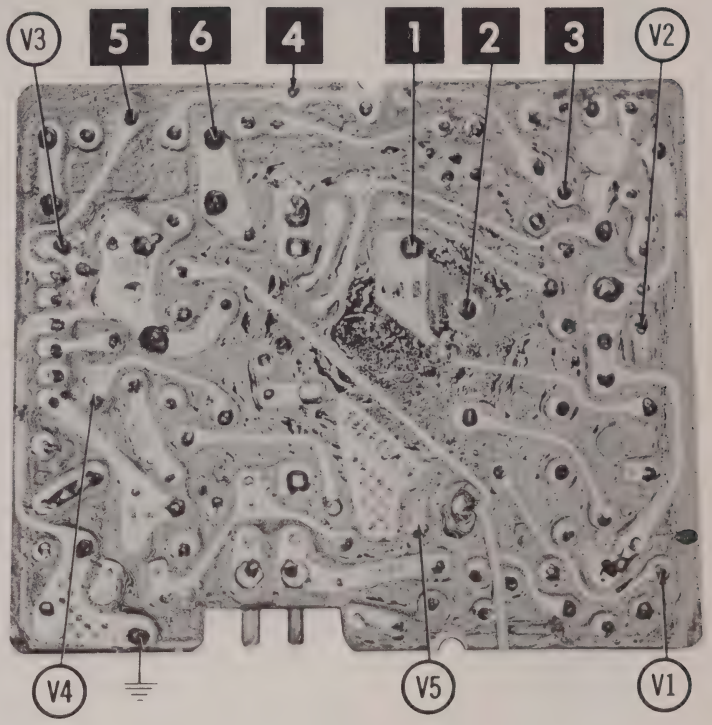
| ITEM No. | USE | REPLACEMENT DATA MOTOROLA PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | Loop Ant. | 24K643963① | | | | | | |
| L2 | Osc. Coil | 24K644646 | | | | | | |
| L3 | 1st IF Trans. | 24C643901 | 16-6780 | 16-6780 | BC-348 | 13-PC1 | RF-4 | |
| L4 | 2nd IF Trans. | 24K643902 | 16-6780 | 16-6780 | BC-349 | 13-PC2 | RF-4 | |

① Includes cabinet back, Model C3-1 Series. C3 Series use Part #24K643961; A2 Series use Part #24C643865; C1, C2 Series use Part #24K643962.

# PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED




MOTOROLA MODELS A2G, N, P, W, CIN, W, C2B, P, W, C3G, -1, C3S, -1, C3W, -1 (Ch. HS-745, HS-749, HS-750)

FOLDER 13

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2800Ω | 3-4Ω | (Part of SP1) | 24S53 | A-3025 | AU-605 | A-3332 | 24S53 | S-12X | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | MOTOROLA PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 50D643924 * | 4A07 | * Includes T1, All Models except A2 Series. |
| | 5" | PM | 3-4Ω | 50C643777 ♦ | | ♦ Includes T1, Models A2 Series. |

## MISCELLANEOUS

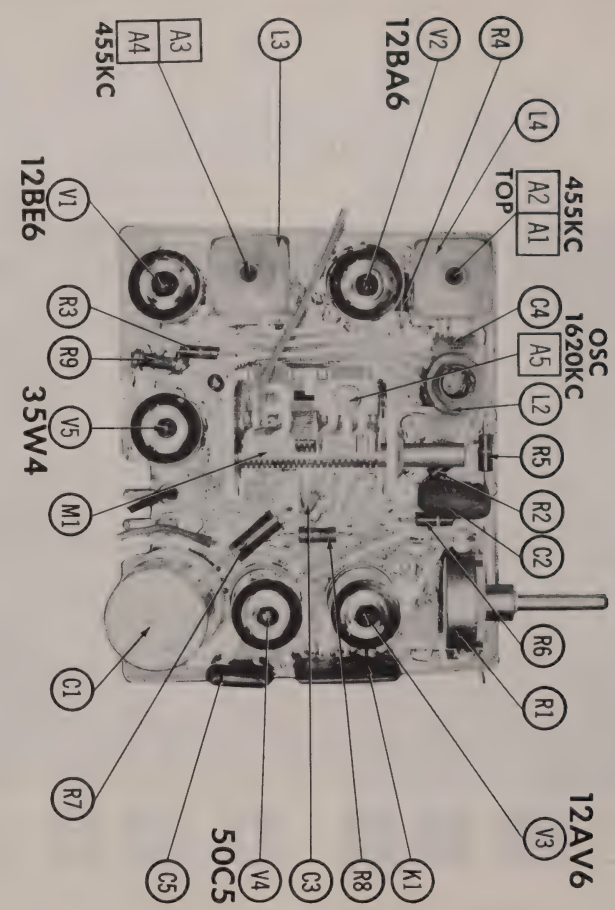
| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap | 19B643905 | 2 Gang |
| M2 | Clock Ass'y. | 72D643973 | Less Pushbutton, Model C3 Series |
| | Clock Ass'y. | 72D644070 | Less Pushbutton, Model C3-1 Series |
| | Clock Ass'y. | 72D643972 | Model C1 Series |
| | Clock Ass'y. | 72D643993 | Model C2 Series |
| | Printed Board | 1V644606 | Less All Components |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 36K644545 | Tuning, Models A2G, C3G, C3G-1 |
| Knob | 36K644546 | Tuning, Model A2N |
| Knob | 36K644541 | Tuning, Models A2P, C2P |
| Knob | 36K644543 | Tuning, Models A2W, C2W, C3W, C3W-1 |
| Knob | 36K643966 | Tuning, Models C1N, C1W |
| Knob | 36B643965 | Tuning, Model C2B |
| Knob | 36K644544 | Tuning, Models C3S, C3S-1 |
| Knob | 36K643948 | Volume, Models A2G, C3G, C3G-1 |
| Knob | 36K643946 | Volume, Models A2N, A2W, C2W, C3W, C3W-1 |
| Knob | 36K643944 | Volume, Models A2P, C2P |
| Knob | 36K643949 | Volume, Models C1N, C1W |
| Knob | 36B643788 | Volume, Model C2B |
| Knob | 36K643947 | Volume, Models C3S, C3S-1 |
| Knob | 36K638216 | Clock, Model C1W |
| Knob | 36B637835 | Clock, Model C2, C3, C3-1 Series |
| Pushbutton | 38K645234 | Clock, Model C3G |
| Pushbutton Ass'y. | 1V646011 | Clock, Includes Escutcheon, Springs & Lever, Model C3G-1 |
| Pushbutton | 38K645233 | Clock, Model C3S |
| Pushbutton Ass'y. | 1V646012 | Clock, Includes Escutcheon, Springs & Lever, Model C3S-1 |
| Pushbutton | 38K643951 | Clock, Model C3W |
| Pushbutton Ass'y. | 1V646013 | Clock, Includes Escutcheon, Springs, & Lever, Model C3W-1 |
| Cabinet Assembly | 1V644627 | Model A2G, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644628 | Model A2N, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644629 | Model A2P, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644637 | Model A2W, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V645881 | Model C1N, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644735 | Model C1W, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644754 | Model C2B, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644755 | Model C2P, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644756 | Model C2W, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644794 | Model C3G, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V646007 | Model C3G-1, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644795 | Model C3S, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V646008 | Model C3S-1, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V644796 | Model C3W, Includes Nameplate, Dial Disc & Dial Scale |
| Cabinet Assembly | 1V646009 | Model C3W-1, Includes Nameplate, Dial Disc & Dial Scale |
| Clock Crystal | 61K643858 | Model C1W |
| Clock Crystal | 61C643857 | Model C2 & C3 Series |
| Clock Crystal | 61K644079 | Model C3-1 Series |

## CHASSIS—TOP VIEW

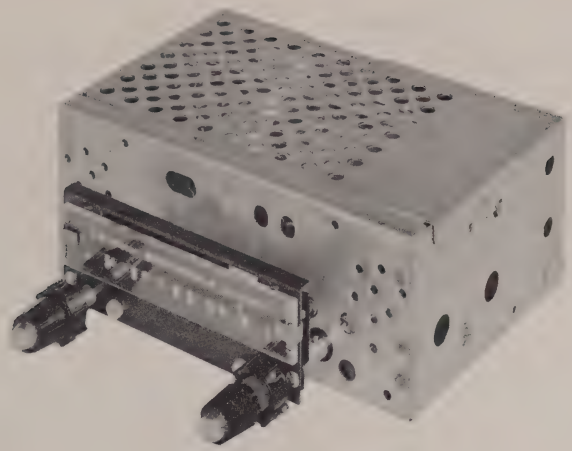



## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. 8874 |

PHOTOFACT® Folder

**MOTOROLA**
**MODEL 10MX**



| | |
|---|---|
| TRADE NAME | Motorola Model 10MX |
| MANUFACTURER | Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois |
| TYPE SET | Battery Operated 4 Tube, 2 Transistor Universal Type Automobile AM Receiver |
| POWER SUPPLY | 12 Volt Storage Battery RATING 1.3 Amp. @ 12.6 Volts DC |
| TUNING RANGE—BROADCAST | 540 — 1610KC |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
- A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440; WALSCO #2526, 2543, 2544, 2545
- A5, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089; WALSCO #2512, 2525, 2528
- A8, A9, A10.... GENERAL CEMENT #9050-L, 9150; WALSCO #2521, 2524

To adjust pointer, set tuner to high frequency end stop. Slide pointer to coincide with dot on right side.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .1mfd to pin 7 of Converter. Low side to chassis. | 262.5KC (400∿ Mod.) | High Freq. End Stop. | Across voice coil. | A1, A2, A3, A4 | Adjust for maximum output. |
| 2. | Thru dummy (Fig. 1) to antenna receptacle. | 1610KC | " | " | A5, A6, A7 | " |
| | Step 3 is not necessary unless tuning coils have been tampered with or replaced. If necessary, back cores (A8, A9, A10) out of coils but not out of coil forms. Repeat Step 2. | | | | | |
| 3. | Thru dummy to antenna receptacle. | 1200KC | Tuner carriage 9/32" from high end stop. | Across voice coil. | A8, A9, A10 | Adjust for maximum output. Repeat Steps 2 and 3 until no further increase is noted. Make step 2 the last step. |
| 4. | With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output. | | | | | |

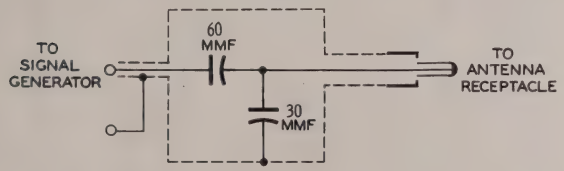
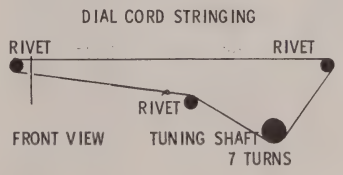



FIG. 1

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KD058



MOTOROLA
MODEL 10MX
MOTOROLA
MODEL 10MX
SET 492 FOLDER 14

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Shielded Hook-up Wire | Use BELDEN No. 8885 |
| Bonding Strap | Use BELDEN No. 8661 |

## TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | RF Amplifier | 12BL6 | V3 | IF Amplifier | 12BL6 |
| V2 | Converter | 12AD6 | V4 | Det.-AVC-AF Amp. | 12F8 |

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | MN53① | Driver | 2N155 | 2N176 | | 2N176 | PNP |
| X2 | 2N176② | Output | | | | | PNP |

① Alternate Type 2N652 may be used in some versions.
② When replacing, apply DC-4 grease (Part #1LM490487) to both sides of insulator. Tighten mounting screws securely.

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | ▪500 | 16 | 23B543279 | AFH3-00-95 | | WP300.85 | | TVLS-3026.8* | |
| B | ▲500 | 16 | | | | | | | |
| C | 100 | 16 | | | | | | | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | 40-450 | #20A542758 | | | | | | |
| C3 | .002 1000V | | P1088N-002 | DD-202 | CUB10D2 | 16DP-1-202 | GEM-1022 | 5HK-D20 |
| C4 | 20-120 | #20K541014 | | | | | | |
| C5 | 47 N750 10% | | N750-DI 47 | DTN-47 | C10Q47U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C6 | 50000 | | BPD-05 | DD-503 | H-05S5 | 4DP-3-503 | GP150 | 5HK-S5 |
| C7 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C8 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C9 | 47 N750 | | N750-DI 47 | DTN-47 | C10Q47U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C10 | 395-470 | #20A485708 | | | | | | |
| C11 | 27 NPO 10% | | NPO-DI 25 | TCZ-27 | C10Q27U | CCTO-270 | CNO-427 | 10TCC-Q27 |
| C12 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C13 | 2000 10% | | DI-2000 | | 1R5D2 | CCD-202 | GP220 | 10TS-D2 |
| C14 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C15 | 25000 | | | | | 6DP-3-253 | GEM-4125 | 5HK-S25 |

## CONTROLS

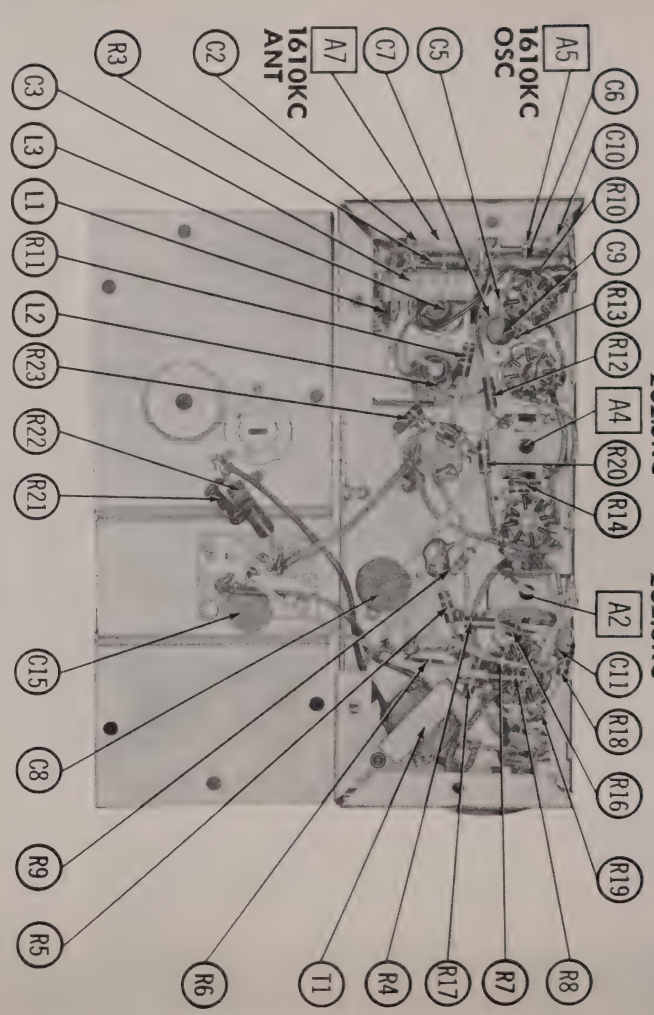
| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MOTOROLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 500K | ½ | 18K542446 | M/U-8 | RTV-664C | | | Tone |
| B | 2meg | | | | | † QJ-1084A | ▪ UE3837-S | Volume |
| C | 1meg Tap Switch | | | | | | | Power Off-On |
| R2 | 300Ω 36Ω Stop | 2(WW) | 18K543493 | | 39-300 * | 112-300 * | FL-500 * | Bias |

† "Concentrikit" Equivalent: K-6 Kit with base elements & shafts: B13-133, P17-129 (Panel) B18-139X, R9-214 (Rear) 76-1 (Switch)

▪ "STA-LOC" Equivalent: FA55A, RU26T16, OS1875, IS2500, US41.

* Use 39Ω series resistor.

# CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 22K | |
| R4 | 3.3meg | |
| R5 | 2.7meg | |
| R6 | 1.5meg | |
| R7 | 3.3meg | |
| R8 | 4.7meg | |
| R9 | 9Imeg | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 22meg | |
| R11 | 3300Ω | |
| R12 | 1.2meg | |
| R13 | 47K | |
| R14 | 220Ω | (330Ω) * |
| R15 | 100K | |
| R16 | 100Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R17 | 10K | |
| R18 | 3300Ω | |
| R19 | 22K | |
| R20 | 820Ω | |
| R21 | 10Ω Cold | #6K543800 |
| R22 | 10Ω | |
| R23 | 330Ω | |

* Alternate Value.
\# Motorola Part Number.

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | MOTOROLA PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Ant. Coil | 24B560429 * | | | | | | *Part of M2 |
| L2 | RF Coil | 24B560432 * | | | | | | |
| L3 | Osc. Coil | 24B560425 * | | | | | | |
| L4 | Input IF Trans. | 24K543286 | 16-6752 | 16-6752 | BC-350 | 12-H1 | RF-3 | |
| L5 | Output IF Trans. | 24K543287 | 16-6754 | 16-6754 | BC-354 | 12-H6 | | |

## FILTER CHOKE

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | DC RES. | INDUCTANCE (0 CURRENT 1000 ~) | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| L6 | 1.3A | .6Ω | .002A | 25K543844 | | | | | | |

## TRANSFORMER (DRIVER)

| ITEM No. | TURNS RATIO | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2.8 | 1 | 25K543842-D ① | | | | | | |

① Alternate Part #25K543842.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 9Ω Tap @ 3-4Ω | 25C542489-A ① | | | | | | | |

① Alternate Part #25C542489.

## SPEAKER

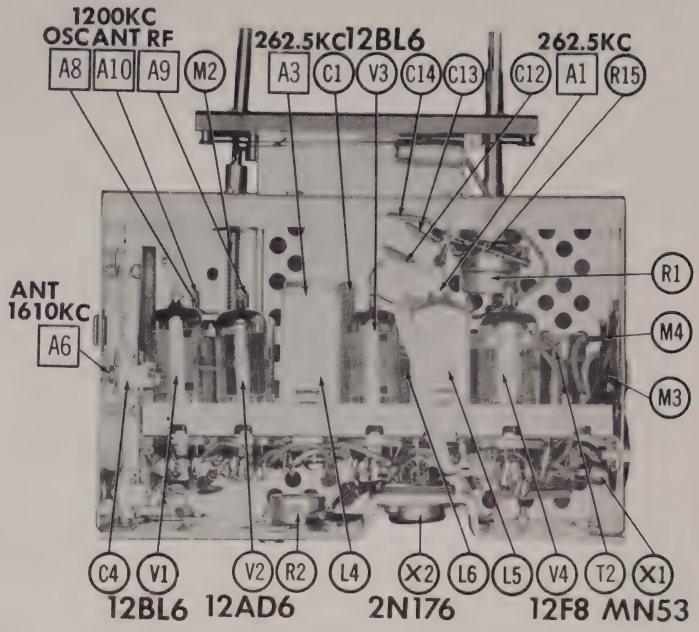
| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | MOTOROLA PART No. | QUAM PART No. | |
| SP1 | 6" x 9" | PM | 3-4Ω | 50C541101 | 69A3 | *Alternate Part Number. |
| | 6" x 9" | PM | 3-4Ω | 50K541105 * | 69A3 | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MOTOROLA PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | SFE | 9A 32V | 65R16248 | 1V541705 ① | 307009 (SFE 9A 32V) | 155009 | SFE 9 | HRH |

① Includes Adapter Arm.

# CHASSIS—TOP VIEW



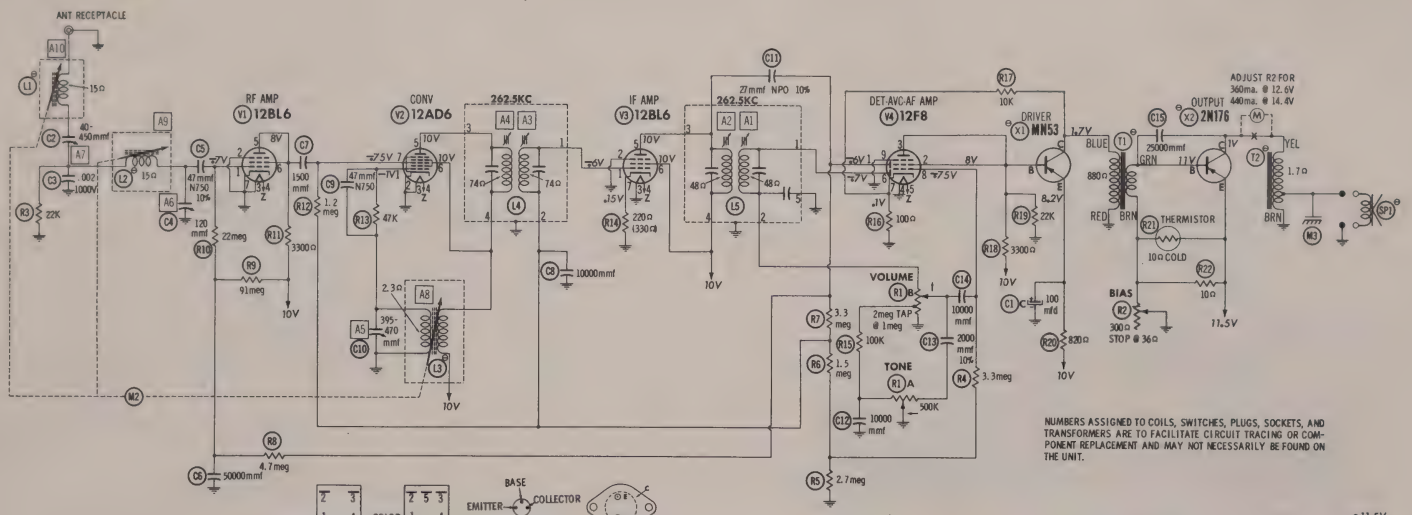

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M2 | Tuner | 77D560423 | (MT-238) Complete |
| M3 | Spark Plate | 64K530177 | |
| M4 | Spark Plate | 64K530177 | |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 36B540048 | Tuning, & Volume |
| Knob | 36B540050 | Tone |
| Knob | 36B540051 | Dummy |
| Pointer | 1K532594 | |
| Dial Scale | 34B541017 | |




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12BL6 | 23meg | 0Ω | 0Ω | .1Ω | 3600Ω | 3600Ω | 0Ω | | |
| V2 | 12AD6 | 47K | 0Ω | 0Ω | .1Ω | 400Ω | 330Ω | 6.5meg | | |
| V3 | 12BL6 | 4.2meg | 0Ω | .1Ω | 0Ω | 380Ω | 330Ω | 220Ω | | |
| V4 | 12F8 | 8meg | 3600Ω | 3600Ω | 0Ω | .1Ω | 2meg | 100Ω | 6meg | 0Ω |

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN ON X1 AND X2 BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1960

**MOTOROLA**
**MODEL 10MX**

PHOTOFACT® Folder

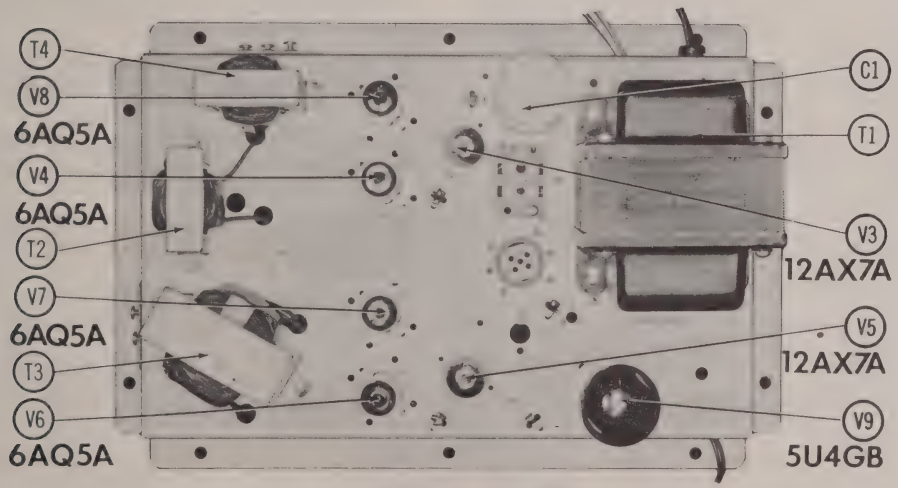
# MOTOROLA MODELS SK36M, SK37CW, SK38B (Ch. HS-767, HS-781)

MOTOROLA MODELS SK36M, SK37CW, SK38B (Ch. HS-767, HS-781)

MODEL SK36M

| | |
|---|---|
| TRADE NAME | Motorola Models SK36M, SK37CW, SK38B (Preamp. Ch. HS-781, Amp. Ch. HS-767) |
| MANUFACTURER | Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois |
| TYPE SET | AC Operated 2 Tube Stereo Preamplifier, 7 Tube Stereo Amplifier and 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 105 Watts, 98 Amp. @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER BR10RC - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11




MOTOROLA MODELS SK36M, SK37CW, SK38B (Ch. HS-767, HS-781)

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# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## TUBES

| ITEM No. | USE | TYPE (• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •) |
|---|---|---|
| V1 | Left Channel Preamp. -<br>Right Channel Preamp. | 12AX7A |
| V2 | Left Channel AF Amp. -<br>Right Channel AF Amp. | 12AX7A |
| V3 | Left Channel AF Amp. -<br>Right Channel AF Amp. | 12AX7A |
| V4 | Left Channel Output | 6AQ5A |
| V5 | Bass Channel AF Amp. -<br>Phase Inverter | 12AX7A |
| V6 | Bass Channel Output | 6AQ5A |
| V7 | Bass Channel Output | 6AQ5A |
| V8 | Right Channel Output | 6AQ5A |
| V9 | Rectifier | 5U4GB |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲40 | 300 | 23K645316 | AFH4-56 | D0470 | FP421.8 | TMQ-61 | TVL-4628 | |
| B | ■40 | 300 | | | | | | | |
| C | ▲40 | 300 | | | | | | | |
| D | 100 | 25 | | | | | | | |
| C2 | 10 | 400 | 23K642196 | AFH1-44 | A0440 | FP142 | | | |
| C3 | 8 | 25 | 23K645315 | XPP-25008 | NLW8-25 | TT25X8 | ML8-25 | TE-1203.5 | |
| C4 | 5 | 10NP | 23B643970 | NP-PRS7405 | BBR10-25 † | TCN105 | | TVANS-1110 * | |
| C5 | 5 | 10NP | 23B643970 | NP-PRS7405 | BBR10-25 † | TCN105 | | TVANS-1110 * | |

† Use two units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REMARKS | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|
| C6 | 1000 | 10% | Note 1 | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C7 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C8 | 100 | | | BPD-0001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C9 | 220 | 10% | Note 1 | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C10 | 1000 | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C11 | 2000 | 10% | | DI-2000 | DD-202 | 1R5D2 | CCD-202 | GP220 | 10TS-D20 |
| C12 | .02 | 200V | | P288N-02 | DD-203 | CUB2S2 | 4DP-2-203 | GEM-412 | 2TM-S2 |
| C13 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C14 | 2000 | 10% | | DI-2000 | | 1R5D2 | CCD-202 | GP220 | 10TS-D20 |
| C15 | 390 | 10% | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C16 | 220 | 10% | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C17 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C18 | 1000 | 10% | | BPD-001 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C19 | 220 | 10% | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C20 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C21 | 3300 | 10% | | DI-3300 | | PM6D33 | CCD-332 | JL-233 | 10TS-D33 |
| C22 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C23 | 1000 | 10% | Note 1 | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C24 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C25 | 100 | | | BPD-0001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C26 | 220 | 10% | Note 1 | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C27 | 1000 | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C28 | 2000 | 10% | | DI-2000 | DD-202 | 1R5D2 | CCD-202 | GP220 | 10TS-D20 |
| C29 | .02 | 200V | | P288N-02 | DD-203 | CUB2S2 | 4DP-2-203 | GEM-412 | 2TM-S2 |
| C30 | .05 | 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |
| C31 | 2000 | 10% | | DI-2000 | | 1R5D2 | CCD-202 | GP220 | 10TS-D20 |
| C32 | 390 | 10% | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C33 | 220 | 10% | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C34 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |

Note 1. Not used in some versions.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | MOTOROLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1meg † | 1/2 | 1V643899 * | | | | | Loudness, Left Channel |
| B | 1meg † | 1/2 | | | | | | Loudness, Right Channel |
| R2A | 2meg | 1/2 | 18A642217 | B-76 | AD47-2meg-Z | | FA26A | Treble, Left Channel |
| B | 2meg | 1/2 | | SR-76 | Not Req. | | RU26A | Treble, Right Channel |
| C | Shaft | | | Not Req. | FS-3 | | CS3500 | |
| R3A | 2meg | 1/2 | 18A642217 | B-76 | AD47-2meg-Z | | FA26A | Bass, Left Channel |
| B | 2meg | 1/2 | | SR-76 | Not Req. | | RU26A | Bass, Right Channel |
| C | Shaft | | | Not Req. | FS-3 | | CS3500 | |
| R4 | 68K | 1/2 | 18K645279 | | | | | Balance |

† Taps @ 100K and 500K. * Includes K1 and K2. (Control Part #18K643897).

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 680K | Note 1. |
| R6 | 47K 1W | |
| R7 | 820Ω | |
| R8 | 180K | |
| R9 | 22K | |
| R10 | 100K | |
| R11 | 56K | |
| R12 | 56K | |
| R13 | 1500Ω 2W | |
| R14 | 4700Ω | |
| R15 | 390K | |
| R16 | 390K | |
| R17 | 2meg | |
| R18 | 120K | |
| R19 | 2200Ω | (820Ω) * |
| R20 | 470K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R21 | 100Ω 5W | |
| R22 | 3300Ω | (1200Ω) * |
| R23 | 1.5meg | |
| R24 | 120K | |
| R25 | 2200Ω | |
| R26 | 220K | |
| R27 | 100Ω | |
| R28 | 120Ω 5W | |
| R29 | 5600Ω | |
| R30 | 220K | |
| R31 | 120K | |
| R32 | 1500Ω 1W | |
| R33 | 220K | |
| R34 | 100Ω | |
| R35 | 680K | Note 1 |
| R36 | 47K 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R37 | 820Ω | |
| R38 | 180K | |
| R39 | 22K | |
| R40 | 100K | |
| R41 | 56K | |
| R42 | 56K | |
| R43 | 1500Ω | |
| R44 | 390K | |
| R45 | 390K | |
| R46 | 2meg | |
| R47 | 120K | |
| R48 | 2200Ω | (820Ω) * |
| R49 | 470K | |
| R50 | 3300Ω | (1200Ω) * |
| R51 | 82Ω 5W | |
| R52 | 2200Ω 1W | |

* Alternate
Note 1. Not used in some versions.

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | MOTOROLA PART No. | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| K1 | Loudness Comp. | 50mmf, 100mmf, 2500mmf, 8000mmf, 33K, 100K | 51K643898 (Part of R1) | Aerovox<br>Centralab<br>Sprague | PA-683<br>PC-325<br>TC-5 |
| K2 | Loudness Comp. | 50mmf, 100mmf, 2500mmf, 8000mmf, 33K, 100K | 51K643898 (Part of R1) | Aerovox<br>Centralab<br>Sprague | PA-683<br>PC-325<br>TC-5 |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V @ .98A | 500VCT @ .190A | 5V @ 3A | 25K645352K ① | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3VCT @ 3.2A | | | | | | | | | |

① Alternate Part #25K645352.

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA MOTOROLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 T3 | 5200Ω 6700Ω CT | 6-8Ω | 25C644068F① | 24S08 | A-2902 | AU-600 | A-3337 | 24S08 | S-53X | |
| | | | 25C645355E② | 24S42 | A-2905 | AU-609③ | A-3880 | 24S42 | S-57Z③ | |
| T4 | 5200Ω | 6-8Ω | 25C644068F① | 24S08 | A-2902 | AU-600 | A-3337 | 24S08 | S-53X | |

① Alternate Part #25C644068 ② Alternate Part #25C645355 ③ Drill New Mounting Hole

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA MOTOROLA PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" | PM | 8-10Ω | 50D645584 | 6A3IZ8. 2 | |
| SP2 | 4" | PM | 6-8Ω | 50C636446 | 4A1Z6 | |
| SP3 | 12" | PM | 6-8Ω | 50D645546 | 12A6A27. 6 | |
| SP4 | 6" | PM | 8-10Ω | 50D645584 | 6A3IZ8. 2 | |
| SP5 | 4" | PM | 6-8Ω | 50C636446 | 4A1Z6 | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA MOTOROLA PART No. FUSE | MOTOROLA PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M1 | 3AG | 3A 125V S/B P/T | 65A646112 | | 313003 (3A 125V) (S/B P/T) | | MDV3 | |

## PHONO CARTRIDGE

| ITEM No. | MOTOROLA PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M2 | 59K645704 | 13TB | | 26S | | | | 8TA4-S | N-8TA-S |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | MOTOROLA PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M3 | 47K645702 † ♦ or 47K645703 † | W-103STSS † or W-103STDS † ♦ | S-69X † or S-69XSD † ♦ | † Jewel ♦ Diamond |

## MISCELLANEOUS

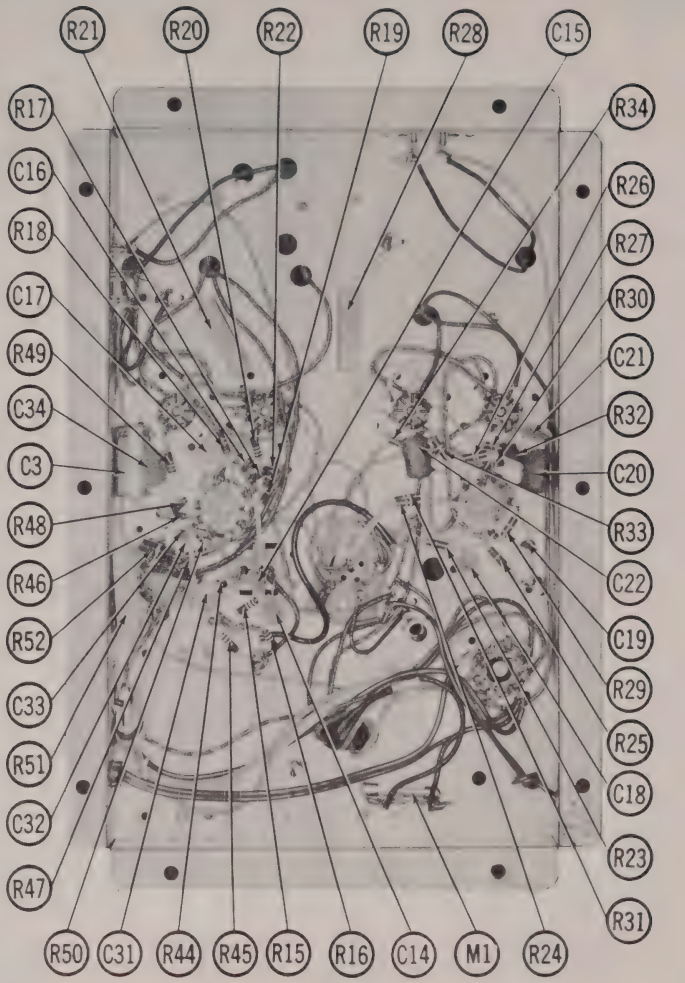
| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M4 | Switch | 40B642153 | Stereo-Monaural (Rotary Wafer Type) |

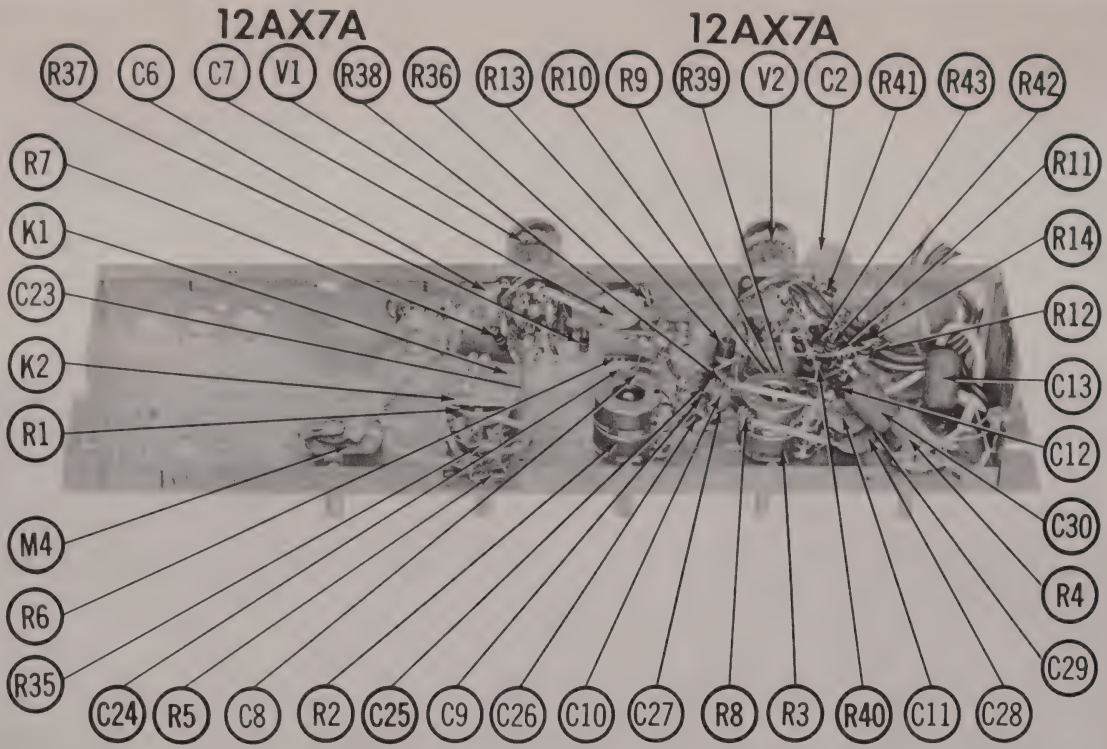
## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

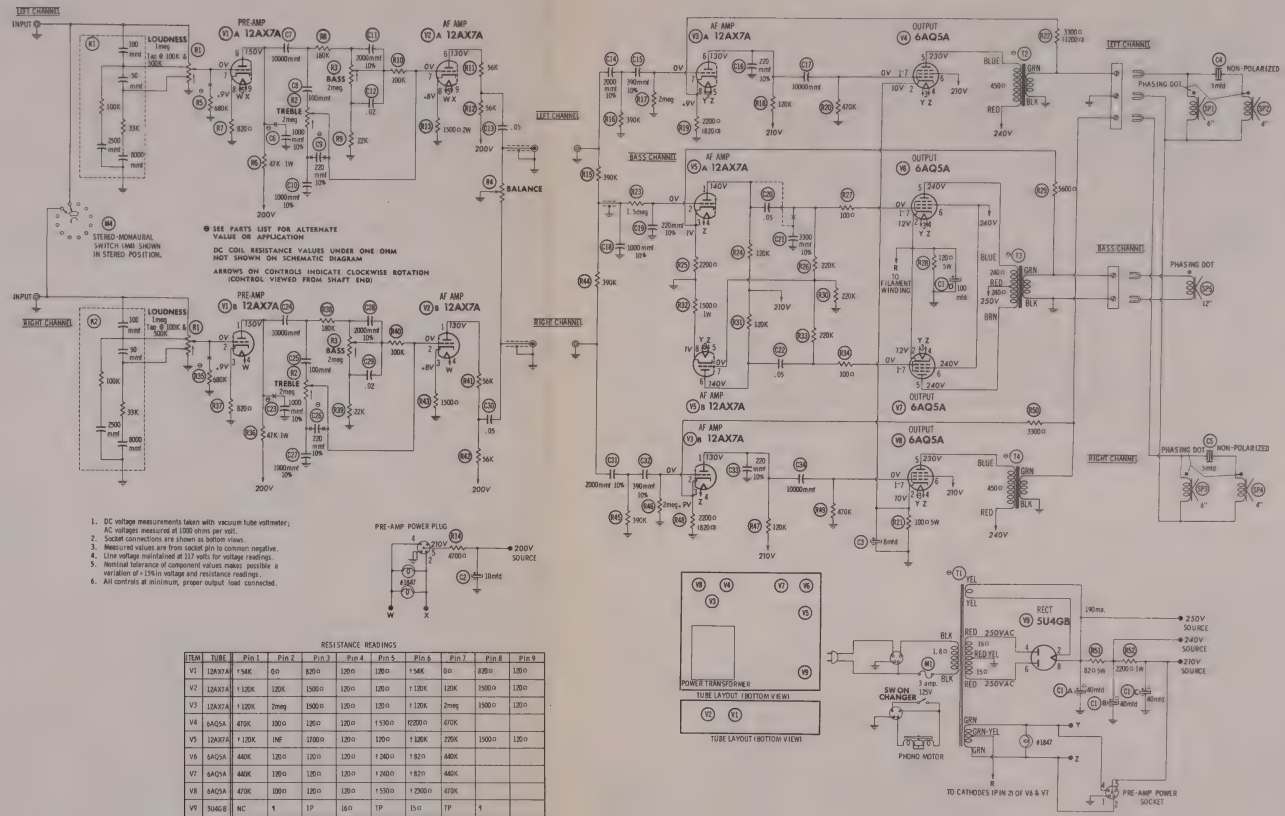
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 36K644283 | Loudness |
| Knob | 36K644284 | Bass, Treble |
| Knob | 36K644286 | Balance |
| Knob | 36K644287 | Function |
| Cabinet | 16E644223 | Model SK36M |
| Cabinet | 16E644230 | Model SK37CW |
| Cabinet | 16E644234 | Model SK38B |
| Cabinet Leg | 16K644237 | Model SK38B |
| Cabinet Lid | 16K644227 | Model SK36M |
| Cabinet Lid | 16K644233 | Model SK37CW |
| Cabinet Lid | 16K644239 | Model SK38B |

# AMP CHASSIS—BOTTOM VIEW






PREAMP CHASSIS - BOTTOM VIEW




1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±5% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7A | ↑54K | 0Ω | 820Ω | 120Ω | 120Ω | ↑54K | 0Ω | 820Ω | 120Ω |
| V2 | 12AX7A | ↑120K | 120K | 1500Ω | 120Ω | 120Ω | ↑120K | 120K | 1500Ω | 120Ω |
| V3 | 12AX7A | ↑120K | 2meg | 1500Ω | 120Ω | 120Ω | ↑120K | 2meg | 1500Ω | 120Ω |
| V4 | 6AQ5A | 470K | 100Ω | 120Ω | 120Ω | ↑530Ω | ↑2200Ω | 470K | | |
| V5 | 12AX7A | ↑120K | INF | 1700Ω | 120Ω | 120Ω | ↑120K | 220K | 1500Ω | 120Ω |
| V6 | 6AQ5A | 440K | 120Ω | 120Ω | 120Ω | ↑240Ω | ↑820Ω | 440K | | |
| V7 | 6AQ5A | 440K | 120Ω | 120Ω | 120Ω | ↑240Ω | ↑820Ω | 440K | | |
| V8 | 6AQ5A | 470K | 100Ω | 120Ω | 120Ω | ↑530Ω | ↑2300Ω | 470K | | |
| V9 | 5U4GB | NC | ¶ | 1P | 16Ω | TP | 15Ω | TP | ¶ | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
1 MEASURED FROM PIN 8 OF V9.
NC NO CONNECTION
TP TIE POINT

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**MOTOROLA MODELS SK36M, SK37CW, SK38B (Ch. HS-767, HS-781)**

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**PHONOLA MODELS
2659, 3159**

PHONOLA MODELS
2659, 3159

MODEL 2659

PHONOLA MODELS
2659, 3159

| | |
|---|---|
| TRADE NAME | Phonola Models 2659, 3159 |
| MANUFACTURER | Waters Conley Co., Inc., Rochester, Minnesota |
| TYPE SET | AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 105 - 125 Volts AC, 60 Cycles RATING 29 Watts, .3 Amp. @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13789 (MODEL 2659) OR PART #13806 (MODEL 3159) — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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JT814



SET492 FOLDER 16

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Left Channel 1 AF Amp. - Right Channel 2 AF Amp. | 12AX7 | V2<br>V3 | Left Channel 1 Output<br>Right Channel 2 Output | 50EH5<br>50EH5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | PHONOLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A<br>B | 80<br>20 | 150<br>150 | 12018 | PRS2220 | BBRD8415 | TCD4975 | TDLD-10 | TVA-2460 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C3 | 2200 | | BPD-0022 | DD-222 | BYA10D22 | CCD-222 | B-222 | 5HK-D22 |
| C4 | 1000 | (100) * | BPD-001 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C5 | 4700 | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | B-247 | 5HK-D47 |
| C6 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C7 | 2200 | | BPD-0022 | DD-222 | BYA10D22 | CCD-222 | B-222 | 5HK-D22 |
| C8 | 1000 | (100) * | BPD-001 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C9 | 4700 | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | B-247 | 5HK-D47 |
| C10 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C11 | .047 200V | | P288N-047 | DD-503 | CUB2S5 | 4DP-3-503 | GEM-4147 | 2TM-S10 |

* Alternate Value

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PHONOLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 5meg | ½ | 13229 | B-88 | AD47-5meg-S | | FA56A | Volume, Channel 1 |
| B | 5meg | ½ | | SR-88 | Not Req. | | RU56A | Volume, Channel 2 |
| C | Shaft | | | Not Req. | KSS-3 | | CS3500 | |
| R2A | 2meg | ½ | 13228 | B-76 | AD47-2meg-Z | | FA26A | Tone, Channel 1 |
| B | 2meg | ½ | | SR-76 | Not Req. | | RU26A | Tone, Channel 2 |
| C | Shaft | | | Not Req. | KSS-3 | | CS3500 | |
| R3A | 1meg | ½ | 13501 | B-69 | A47-1meg-S | Q11-137 | U54 | Balance |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

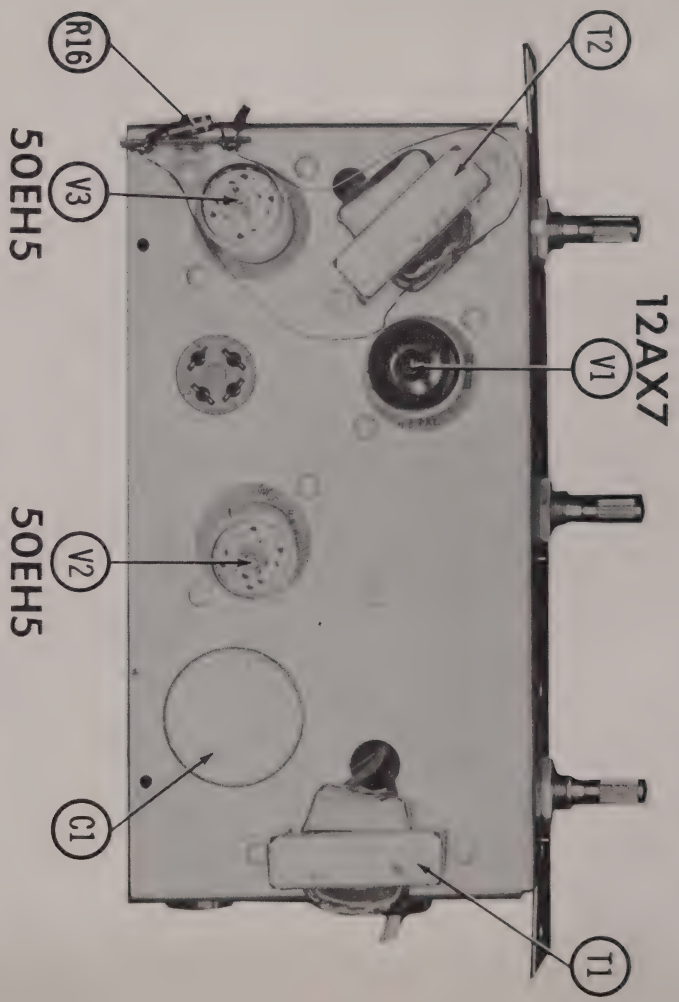
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 10meg | |
| R5 | 270K | |
| R6 | 10meg | |
| R7 | 4700Ω 1W | |
| R8 | 68Ω | |

* Used in Model 3159.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 10meg | |
| R10 | 270K | |
| R11 | 10meg | |
| R12 | 68Ω | |
| R13 | 15Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R14 | 15Ω 1W | (22Ω) * |
| R15 | 33Ω 1W | |
| R16 | 47Ω | |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | PHONOLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2500Ω | 1-2Ω | 12442 | | | | A-3877① | | | |
| T2 | 2500Ω | 1-2Ω | 12442 | | | | A-3877① | | | |

① Drill New Mounting Holes.

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | PHONOLA PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 11792 | 4A07 | |
| SP2 | 4" | PM | 3-4Ω | 11792 | 4A07 | |
| SP3 | 4" | PM | 3-4Ω | 11792 | 4A07 | |
| SP4 | 4" | PM | 3-4Ω | 11792 | 4A07 | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | PHONOLA PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M1 | .055A | 13782 | 2E4 | HA154 | K200 | SR200 | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PHONOLA PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M2 | WC13376 (Includes M3) | 13TB | | 26S | S1-1 S3-3 | | | 8TA4-S | N-8TA-S |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | PHONOLA PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M3 | WC13377 | W-103STSS † or W-103STDS †♦ | S-69X † or S-69XSD †♦ or S-69XDD ♦ | † Jewel ♦ Diamond |

## CABINETS & CABINET PARTS

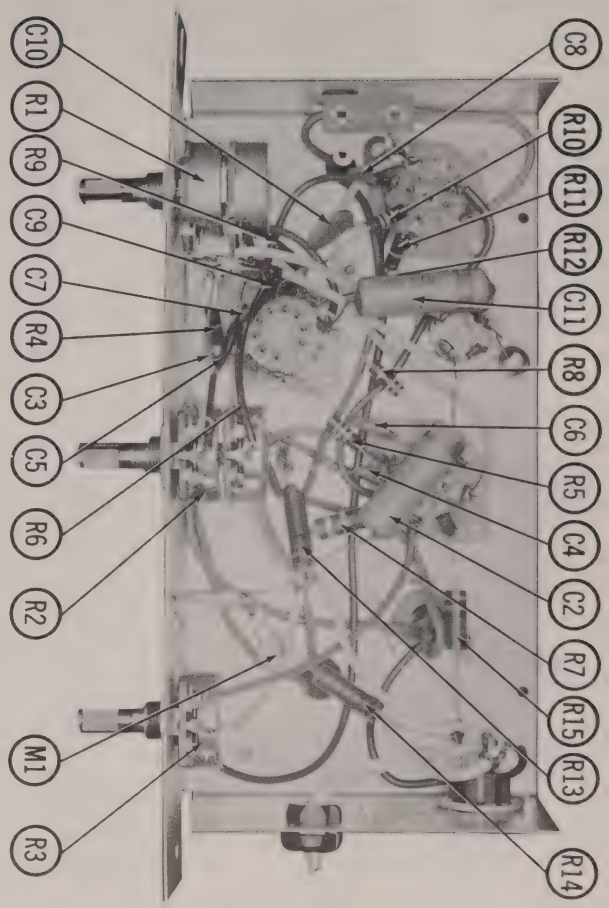
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

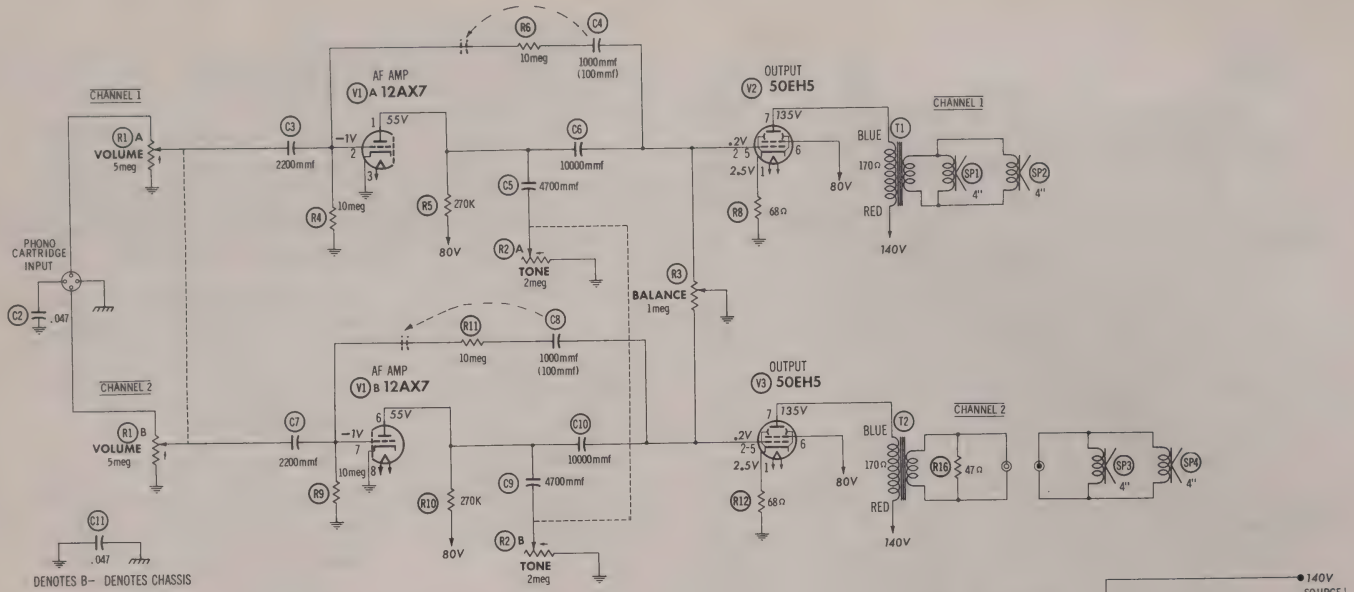
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 13440-8E | Control |
| Case Assembly | 13-791 | Model 2659 |
| Case Assembly | 13-805 | Model 3159 |
| Handle | 13448-8B | Model 2659 |
| Handle | 13445-6B | Model 3159 |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

# CHASSIS—BOTTOM VIEW

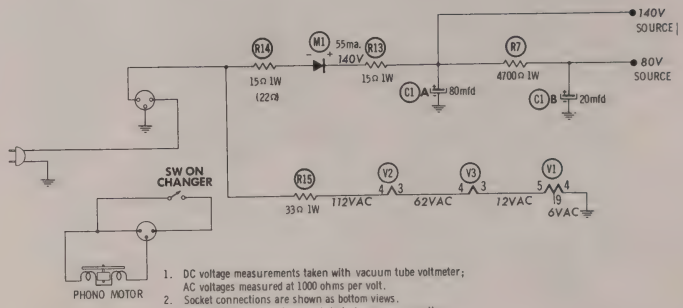





RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †270K | 10meg | 0Ω | 0Ω | 12Ω | †270K | 10meg | 0Ω | 6Ω |
| V2 | 50EH5 | 68Ω | 500K | 62Ω | 112Ω | 500K | †4700Ω | †285Ω | | |
| V3 | 50EH5 | 68Ω | 500K | 12Ω | 62Ω | 500K | †4700Ω | †285Ω | | |

† MEASURED FROM OUTPUT OF M1.




DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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**PHONOLA MODELS 2659, 3159**

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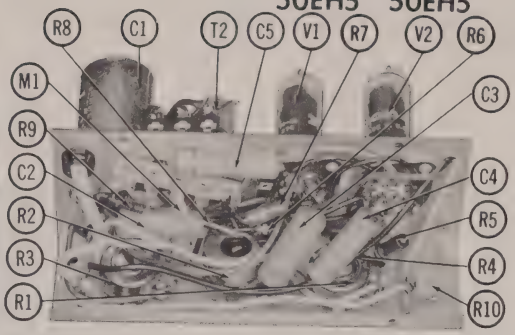
# PHONOLA MODELS 2959, 3059

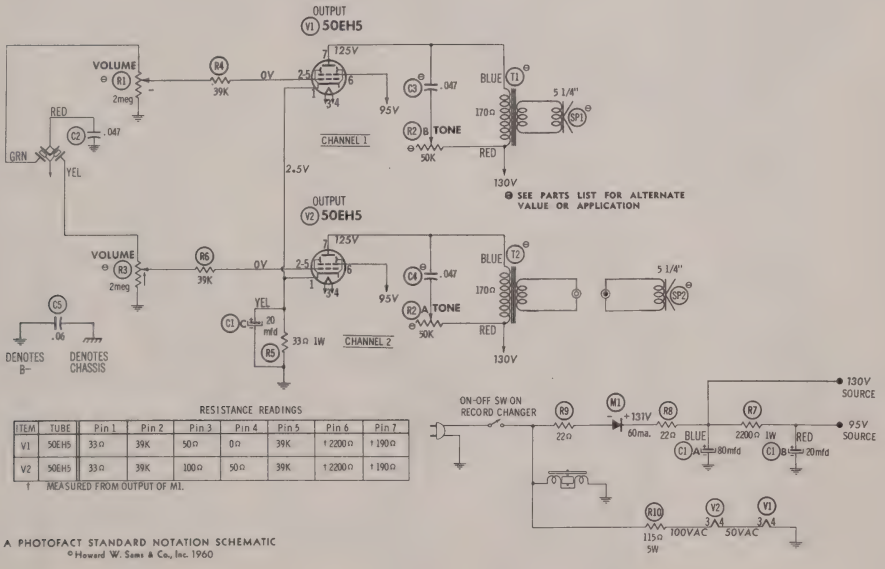
PHONOLA MODELS
2959, 3059

MODEL 3059




| | |
|---|---|
| TRADE NAME | Phonola Models 2959, 3059 |
| MANUFACTURER | Waters Conley Co., Inc., Rochester, Minnesota |
| TYPE SET | AC Operated 2 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer (Model 2959 is 4 Speed Manual Record Player) |
| POWER SUPPLY | 105 - 125 Volts AC, 60 Cycles RATING 28 Watts, .3 Amp. @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13757 (Model 3059) — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12




A PHOTOFACT STANDARD NOTATION SCHEMATIC
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JT 815



SET 492 FOLDER 17

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆ | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Channel 1 Output | 50EH5 | V2 | Channel 2 Output | 50EH5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | PHONOLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | 80 | 150 | 12145 | PRS4650 | BBRT8415C | TCT3117 | TDLT-7 | TVA-3455 | |
| B | 20 | 150 | | | | | | | |
| C | 20 | 25 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | EMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C3 | .047 200V | Note 1 | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C4 | .047 200V | Note 1 | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C5 | .06 200V | | P288N-06 | | CUB6S6 | 6DP-4-603 | GEM-416 | 6TM-S6 |

Note 1. Not used in Model 2959.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PHONOLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 2meg | 1/2 | 12400 | B-76 | | | | Volume, Channel 1. Note 1 |
| B | Bushing | | | AK-31 | | | | |
| R2A | 50K | 1/2 | 13650 | B-32 | | | | Tone, Channel 2. Note 2 |
| B | 50K | 1/2 | | SR-32 | | | | Tone, Channel 1. |
| R3A | 2meg | 1/2 | 12400 | B-76 | | | | Volume, Channel 2. Note 3 |
| B | Bushing | | | AK-31 | | | | |

Note 1. Model 2959 uses control with switch (Part #13069).
Note 2. Not used in Model 2959.
Note 3. Model 2959 uses Part #13786.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 39K | |
| R5 | 33Ω 1W | |
| R6 | 39K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R7 | 2200Ω 1W | |
| R8 | 22Ω | |
| R9 | 22Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 115Ω 5W | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | PHONOLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 3400Ω | 3-4Ω | (Part of SP1) | 24S48 | A-3025 | AU-605 | A-3332 | 24S48 | S-12X | |
| T2 | 3400Ω | 3-4Ω | 13706① | 24S48 | A-3025 | AU-605 | A-3332 | 24S48 | S-12X | |

① Model 2959 uses Part #13649.

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | PHONOLA PART No. | QUAM PART No. | |
| SP1 | 5 1/4" | PM | 3-4Ω | 13705 * | 52A21 | * Includes T1. |
| SP2 | 5 1/4" | PM | 3-4Ω | 10901 | 52A1 | ① Model 2959 |
| | 4" | PM | 3-4Ω | 13897 * ① | | |
| | 4" | PM | 3-4Ω | 11792 ① | | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | PHONOLA PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M1 | .060A | 13782 | 2E4 | HA154 | K200 | SR200 | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PHONOLA PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M2 | WC13936 (Includes M3) | 70TS | | 96 | | | | 12TH-5 | |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | PHONOLA PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M3 | WC13937 (78 RPM) | | CRA-57 † or CRA-57D ♦ | † Jewel ♦ Diamond |
| | WC13938 (LP) | | CRA-57X † or CRA-57XD ♦ | |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 12126-1E | Volume, Tone; Model 3059 |
| Knob | 12126-8E | Volume, Tone; Model 2959 |
| Case Assembly | 13759 | Model 3059 |
| Case Assembly | 13755 | Model 2959 |
| Handle | 13056-8B | Model 3059 |
| Handle | 13688-8B | Model 2959 |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

PHOTOFACT® Folder

**ROLAND MODELS
1-0931, 2-0931**

ROLAND MODELS
1-0931, 2-0931

MODEL 2-0931

ROLAND MODELS
1-0931, 2-0931

| | |
|---|---|
| TRADE NAME | Roland Models 1-0931, 2-0931 |
| MANUFACTURER | Roland Radio Corp., 716 S. Columbus Ave., Mount Vernon, N. Y. |
| TYPE SET | AC Operated 3 Tube Audio Amplifier |
| POWER SUPPLY | 110 - 120 Volts AC, 60 Cycles RATING 30 Watts, .31 Amp. @117 Volts AC |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JX808

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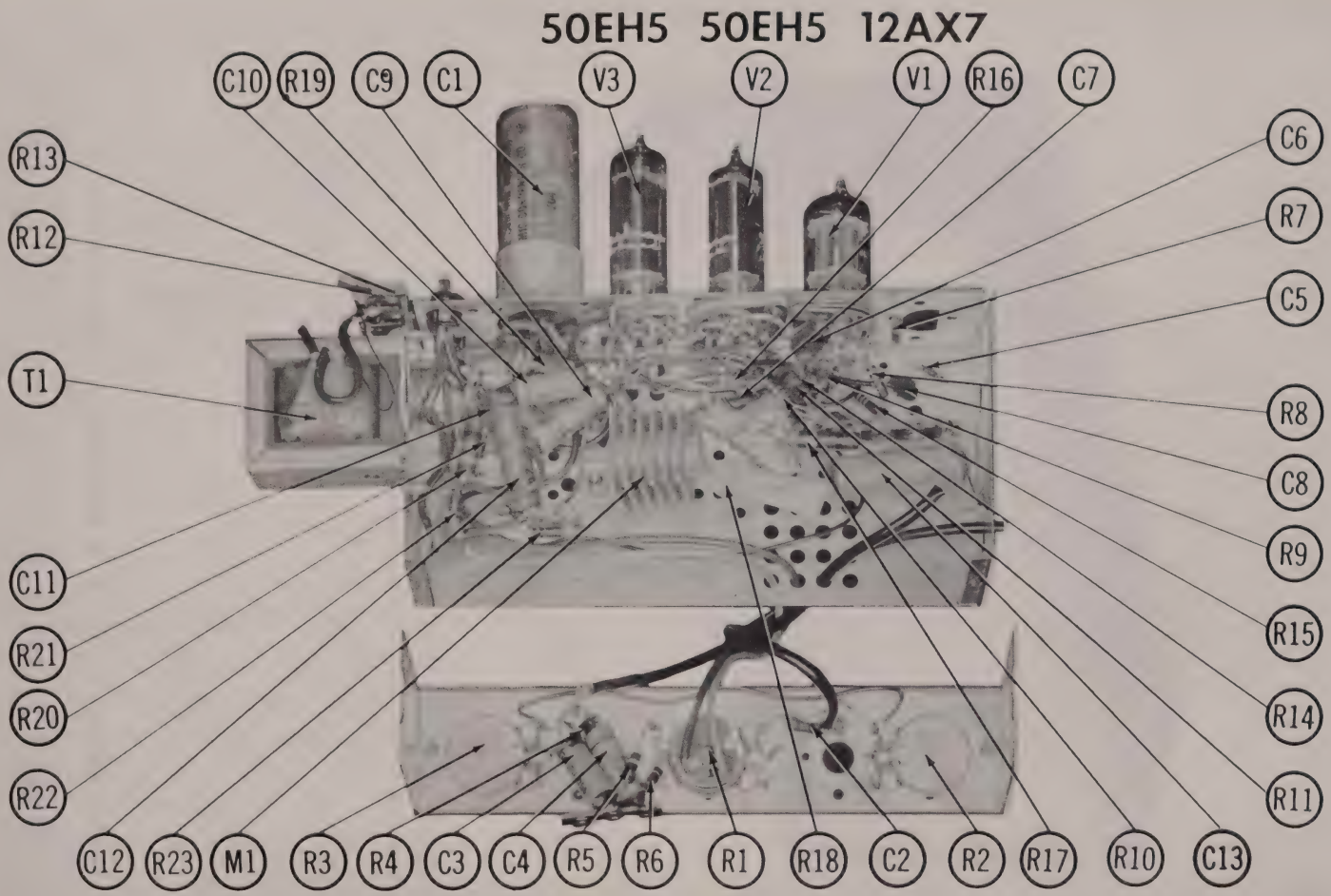
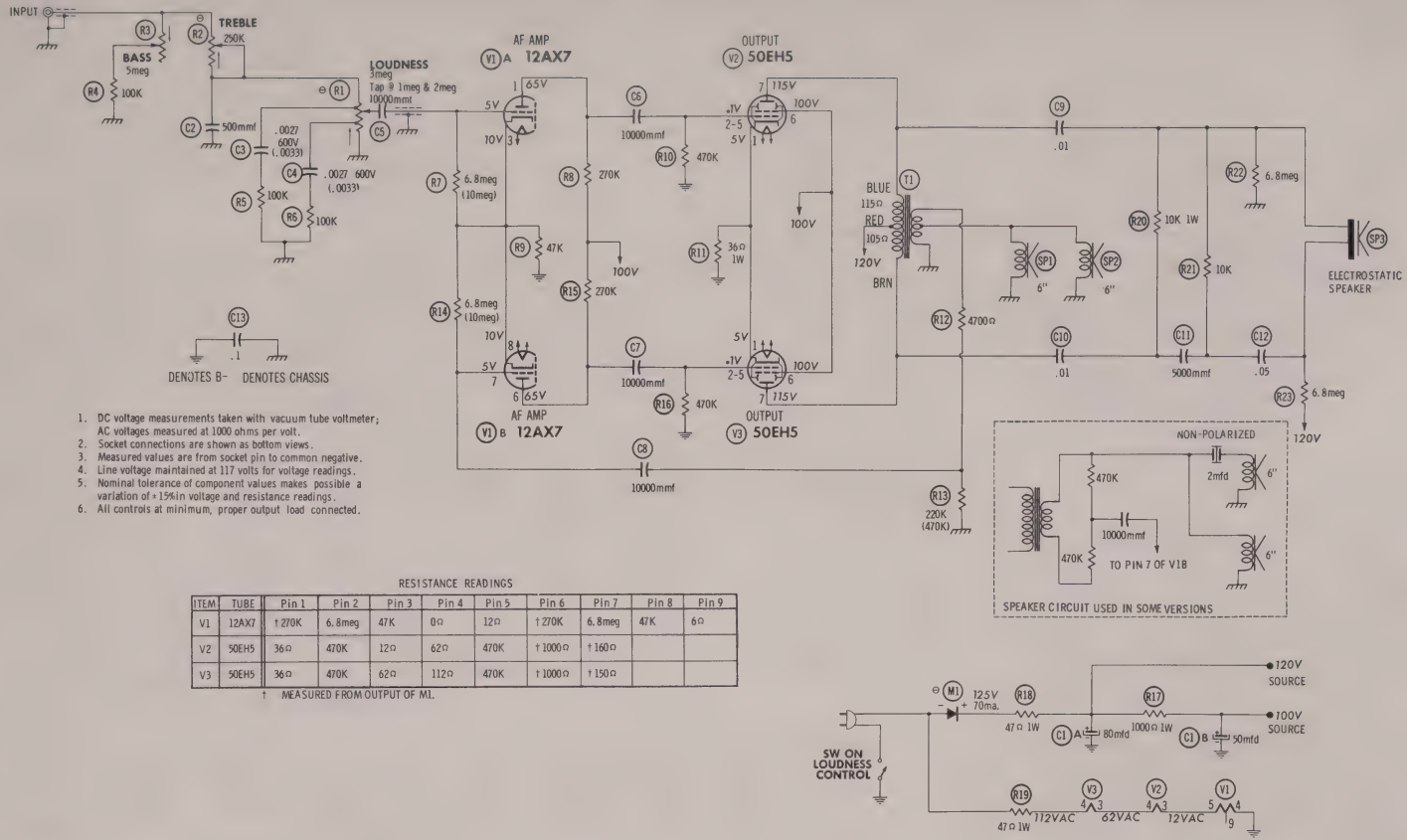



CHASSIS BOTTOM VIEW




1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †270K | 6.8meg | 47K | 0Ω | 12Ω | †270K | 6.8meg | 47K | 6Ω |
| V2 | 50EH5 | 36Ω | 470K | 12Ω | 62Ω | 470K | †1000Ω | †160Ω | | |
| V3 | 50EH5 | 36Ω | 470K | 62Ω | 112Ω | 470K | †1000Ω | †150Ω | | |

† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**ROLAND MODELS 1-0931, 2-0931**

ROLAND MODELS
1-0931, 2-0931

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | |
|---|---|---|
| ITEM No. | USE | TYPE |
| V1 | AF Amp. -Phase Inv. | 12AX7 |
| V2 | Output | 50EH5 |
| V3 | Output | 50EH5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | ROLAND PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | 80 | 150 | 582004 | PRS2240 | BBRD8515 | TCD498 | TDLD-12 | TVA-2462 | |
| B | 50 | 150 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | 500 | | SI 500 | DD-501 | BYA10T5 | CCD-501 | GP350 | 10TS-T50 |
| C3 | .0027 600V | (.0033) * | P688N-003 | D6-272 | CUB6D3 | 6DP-1-272 | GEM-623 | 6TM-D3 |
| C4 | .0027 600V | (.0033) * | P688N-003 | D6-272 | CUB6D3 | 6DP-1-272 | GEM-623 | 6TM-D3 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C7 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C8 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C9 | .01 400V | | P488N-01 | D6-103 | CUB4S1 | 4DP-1-103 | GEM-411 | 4TM-S1 |
| C10 | .01 400V | | P488N-01 | D6-103 | CUB4S1 | 4DP-1-103 | GEM-411 | 4TM-S1 |
| C11 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D5 |
| C12 | .05 200V | | P288N-05 | DD-503 | CUB2S5 | 4DP-3-503 | GEM-415 | 2TM-S5 |
| C13 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |

* Alternate Value.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ROLAND PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 3meg * | ½ | 368026 ① | | | | | Loudness |
| B | Switch | | | | | | | Power Off-On |
| R2A | 250K | ½ | 360260 ② | B-50 | A47-250K-S | Q11-130 | U46 | Treble |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R3A | 5meg | ½ | 360330 | B-88 | A47-5meg-Z | Q13-141 | U65 | Bass |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |

* Taper (A) 1 and 2 meg.
① Alternate Part #368009.
② Alternate Part #360265.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 100K | |
| R5 | 100K | |
| R6 | 100K | |
| R7 | 6.8meg | (10meg) * |
| R8 | 270K | |
| R9 | 47K | |
| R10 | 470K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R11 | 36Ω 1W | |
| R12 | 4700Ω | |
| R13 | 220K | (470K) * |
| R14 | 6.8meg | (10 meg) * |
| R15 | 270K | |
| R16 | 470K | |
| R17 | 1000Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R18 | 47Ω 1W | |
| R19 | 47Ω 1W | |
| R20 | 10K 1W | |
| R21 | 10K | |
| R22 | 6.8meg | |
| R23 | 6.8meg | |

* Alternate Value.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ROLAND PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 3800Ω CT | 3-4Ω CT | 430222 | | | | | | | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | ROLAND PART No. | QUAM PART No. | |
| SP1 | 6" | PM | 3-4Ω | 406001 | 6A21 | |
| SP2 | 6" | PM | 3-4Ω | 406001 | 6A21 | |
| SP3 | ELECTROSTATIC | | | 409001 | | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | ROLAND PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M1 | .070A | 380002 * 380011① | T100 * | 1235AH * | 100A * | SR200 ♦ | * Selenium Type<br>♦ Silicon Type.<br>① Alternate Part No. |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 270148 | Control |
| Cabinet | 211180 | Mahogany |
| Cabinet | 211181 | Walnut |
| Cabinet | 211182 | Fruitwood |
| Cabinet | 211183 | Blonde |
| Cabinet | 211184 | Ebony |

## WIRING DATA

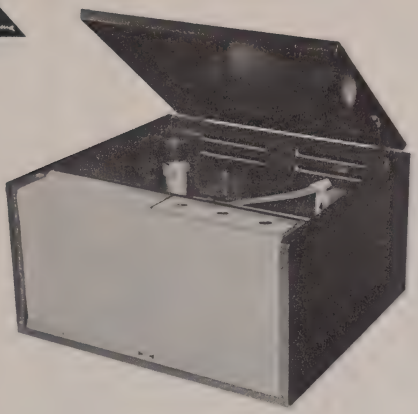
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

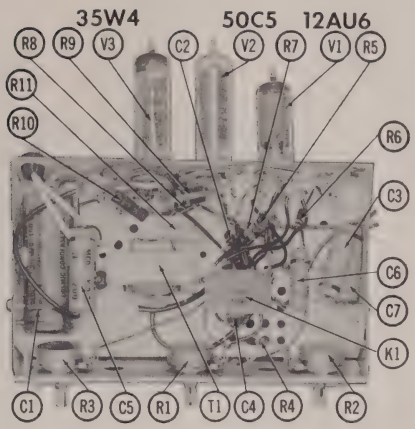
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

# PHOTOFACT® Folder

## ROLAND
## MODEL 41-881

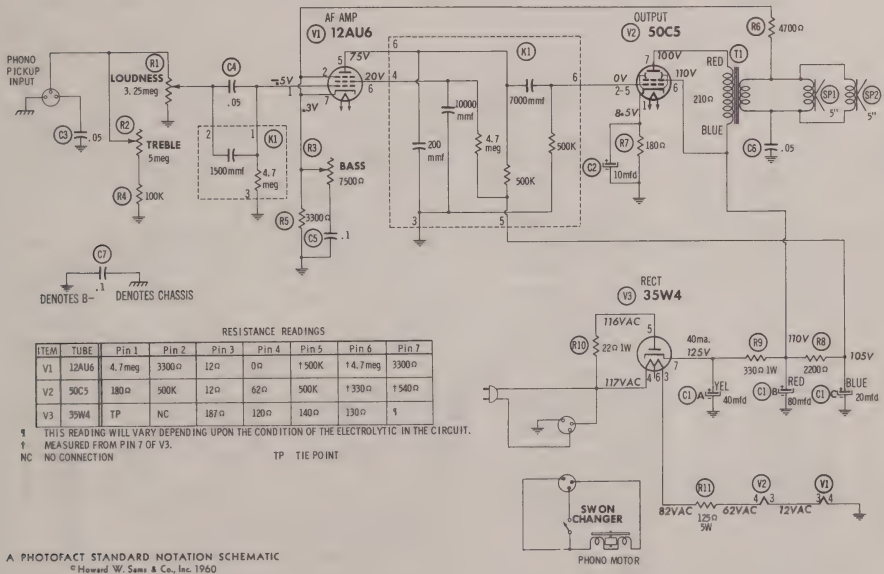
ROLAND
MODEL 41-881






| | |
|---|---|
| TRADE NAME | Roland Model 41-881 |
| MANUFACTURER | Roland Radio Corp., 716 S. Columbia Ave., Mount Vernon, N. Y. |
| TYPE SET | AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 25 Watts, .24 Amp. @117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16
OR RECORD CHANGER MANUAL RC-10




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12AU6 | 4.7meg | 3300Ω | 12Ω | 0Ω | ↑500K | ↑4.7meg | 3300Ω |
| V2 | 50C5 | 180Ω | 500K | 12Ω | 62Ω | 500K | ↑330Ω | ↑540Ω |
| V3 | 35W4 | TP | NC | 187Ω | 120Ω | 140Ω | 130Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ROLAND
MODEL 41-881

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT809



SET 492 FOLDER 19

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | AF Amplifier | 12AU6 | V3 | Rectifier | 35W4 |
| V2 | Output | 50C5 | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA ROLAND PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 150 | | PRS3800 | BBRT84215 | TCT3117 | TDLT-7 | TVA-3455 | |
| B | 80 | 150 | | | | | | | |
| C | 20 | 150 | | | | | | | |
| C2 | 10 | 50 | | PWE50010 | NLW10-50 | TT50X10 | ML10-50 | TE-1304 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C3 | .05 200V | | P288N-05 | DD-503 | CUB2S5 | 4DP-3-503 | GEM-415 | 2TM-S5 |
| C4 | .05 200V | | P288N-05 | DD-503 | CUB2S5 | 4DP-3-503 | GEM-415 | 2TM-S5 |
| C5 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C6 | .05 200V | | P288N-05 | DD-503 | CUB2S5 | 4DP-3-503 | GEM-415 | 2TM-S5 |
| C7 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA ROLAND PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 3.25meg | ½ | 360320 | B-85 | A47-3meg-Z | Q13-140 | U57 | Loudness |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R2A | 5meg | ½ | 360330 | B-88 | A47-5meg-Z | Q13-141 | U65 | Treble |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R3A | 7500Ω | ½ | 360225 | B-13 | A47-7500-S | Q11-115 | U18 | Bass |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 100K | |
| R5 | 3300Ω | |
| R6 | 4700Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R7 | 180Ω | |
| R8 | 2200Ω | |
| R9 | 330Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 22Ω 1W | |
| R11 | 125Ω 5W | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | ROLAND PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Audio Coupling | 200mmf, 1500mmf, 7000mmf, 10000mmf, 500K, 500K, 4.7meg, 4.7meg | HPC-2A | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA ROLAND PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 4400Ω | 3-4Ω | 430211 | 24S51 | A-2930 | AU-601 | A-3877 | 24S51 | S-3X | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA ROLAND PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 5" | PM | 3-4Ω | 405005 | 5A1 | |
| SP2 | 5" | PM | 3-4Ω | 405005 | 5A1 | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA ROLAND PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M1 | 322504 | | | 66① | Not Req. | | | 8TA4-S | N-8TA-S |

① Use Mount PT-3.

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA ROLAND PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M2 | (LP) | W-104MGS † or W-104MGD ♦ | CRA-57X † or CRA-57XD ♦ | † Jewel ♦ Diamond |
| | (78 RPM) | W-104STS † or W-104STD ♦ | CRA-57 † or CRA-57D ♦ | |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 270148 | All Controls |
| Cabinet | 210760 | Mahogany |
| Cabinet | 210761 | Blonde |
| Cabinet | 210762 | Walnut |
| Cabinet | 210763 | Fruitwood |
| Cabinet | 210764 | Ebony |

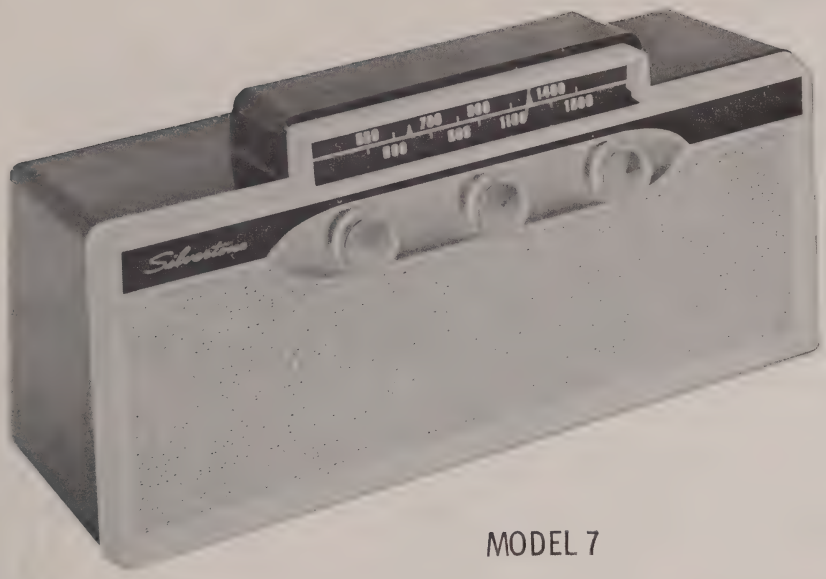
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

# SILVERTONE MODELS 7, 8, 9, 10
# (Ch. 132.45601, 132.45602)

SILVERTONE MODELS 7, 8, 9, 10
(Ch. 132.45601, 132.45602)




MODEL 7

SILVERTONE MODELS 7, 8, 9, 10
(Ch. 132.45601, 132.45602)

| | |
|---|---|
| TRADE NAME | Silvertone Models 7, 8, 9, 10 (Ch. 132.45601, 132.45602) |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois |
| TYPE SET | AC-DC Operated 5 Tube AM Receiver |
| POWER SUPPLY | 110-120 Volts AC-DC RATING 27 Watts, .27 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 540 - 1670KC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4, A7.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1 | High side thru .05mfd to pin 7 (grid) of Converter. Low side to chassis | 455KC (400~ mod.) | Tuning gang fully open | Across voice coil | A1, A2 A3, A4 | Adjust for maximum output. |
| 2 | Loop | 1670KC | " | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3 | " | 1400KC | Tune to 1400KC signal | " | A6 | " |
| 4 | " | 600KC | Tune to 600KC signal | " | A7 | Adjust for maximum output while rocking tuning gang. |

SET492 FOLDER 20

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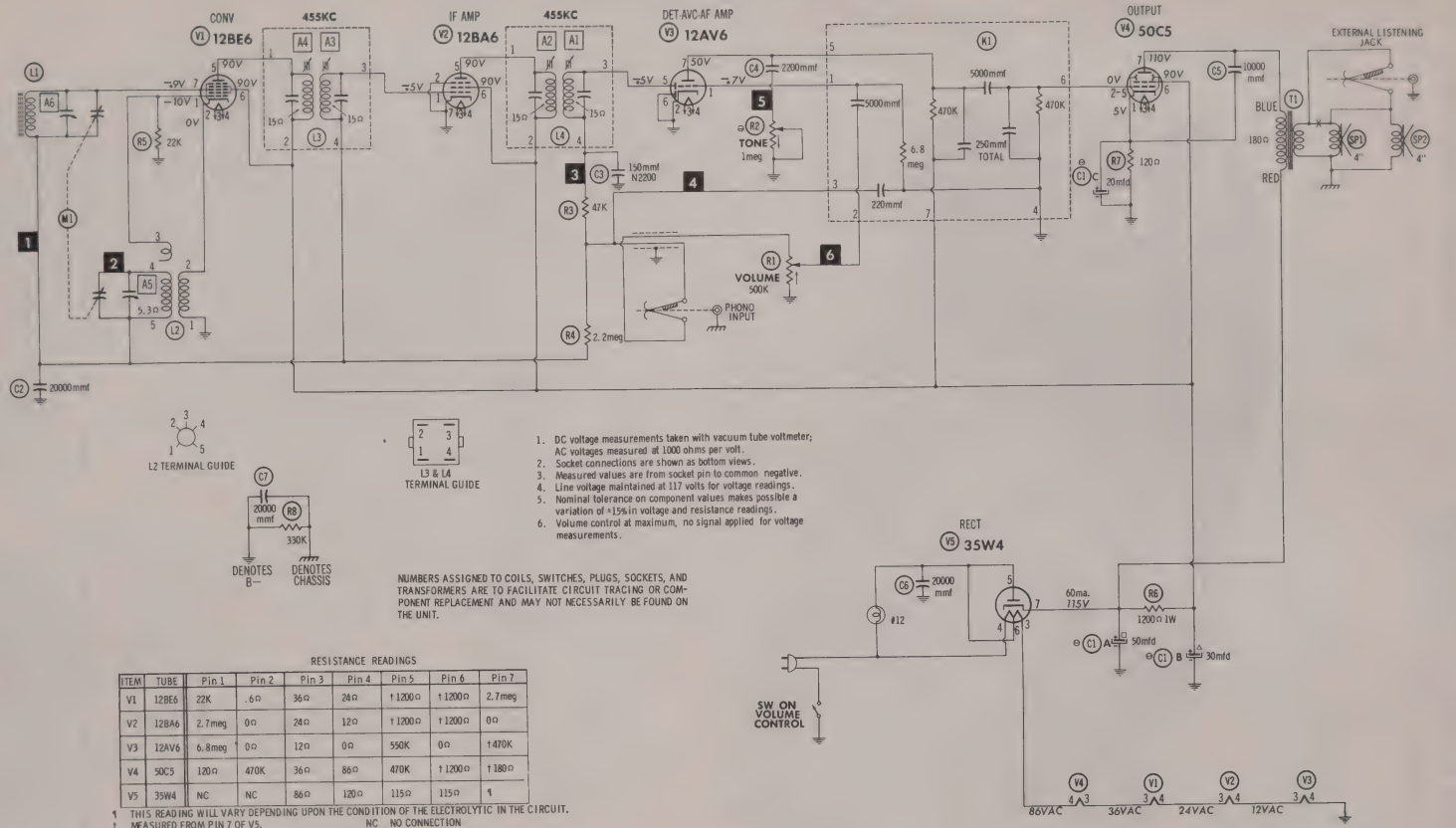
JG748




L2 TERMINAL GUIDE

L3 & L4 TERMINAL GUIDE

DENOTES B— DENOTES CHASSIS

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12BE6 | 22K | .6Ω | 36Ω | 24Ω | †1200Ω | †1200Ω | 2.7meg |
| V2 | 12BA6 | 2.7meg | 0Ω | 24Ω | 12Ω | †1200Ω | †1200Ω | 0Ω |
| V3 | 12AV6 | 6.8meg | 0Ω | 12Ω | 0Ω | 550K | 0Ω | †470K |
| V4 | 50C5 | 120Ω | 470K | 36Ω | 86Ω | 470K | †1200Ω | †180Ω |
| V5 | 35W4 | NC | NC | 86Ω | 120Ω | 115Ω | 115Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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**SILVERTONE MODELS 7, 8, 9, 10**
**(Ch. 132.45601, 132.45602)**

# PARTS LIST AND DESCRIPTIONS

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Converter | 12BE6 |
| V2 | IF Amplifier | 12BA6 |
| V3 | Det - AVC-AF Amp | 12AV6 |
| V4 | Output | 50C5 |
| V5 | Rectifier | 35W4 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ■50 | 150 | 43711-1 ⓙ | PWH3-81-50 | CO560 ‡ | PFP311.63 | | PCL-3431.1 | |
| B | ▲30 | 150 | | | | | | | |
| C | 20 | 25 | | | | | | | |

ⓙ Chassis 132.4560l Use Part #44328-2
‡ Use Printed Circuit Adapters #55277 and 55278

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C2 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C3 | 150 N2200 | | | | | * | | 30TCY-T15 |
| C4 | 2200 | | BPD-0022 | DD-222 | BYA10D22 | CCD-222 | GP222 | 5HK-D22 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP203 | 5HK-S20 |
| C7 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP203 | 5HK-S20 |

#Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA SILVERTONE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | 44500-6 | | C47S-500K-Z | B13-133 | PP55A | Volume |
| B | Switch | | | | Not Req. | SK7 | Not Req. | |
| R2A | 1meg | ½ | 44500-7 | B-70 | A47-1meg-Z | Q13-137 | U53 | Tone Note 1 |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |

Note 1. Some versions may use 500K in this application (Part #44500-17)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 47K | |
| R4 | 2.2meg | |
| R5 | 22K | |
| R6 | 1200Ω 1W | |
| R7 | 120Ω | |
| R8 | 330K | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | SILVERTONE PART No. | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| K1 | Audio Coupling | 220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg | 43743-2 | Aerovox<br>Centralab<br>Sprague | PA-512-3<br>PC-158<br>DT-5 |

# PRINTED BOARD

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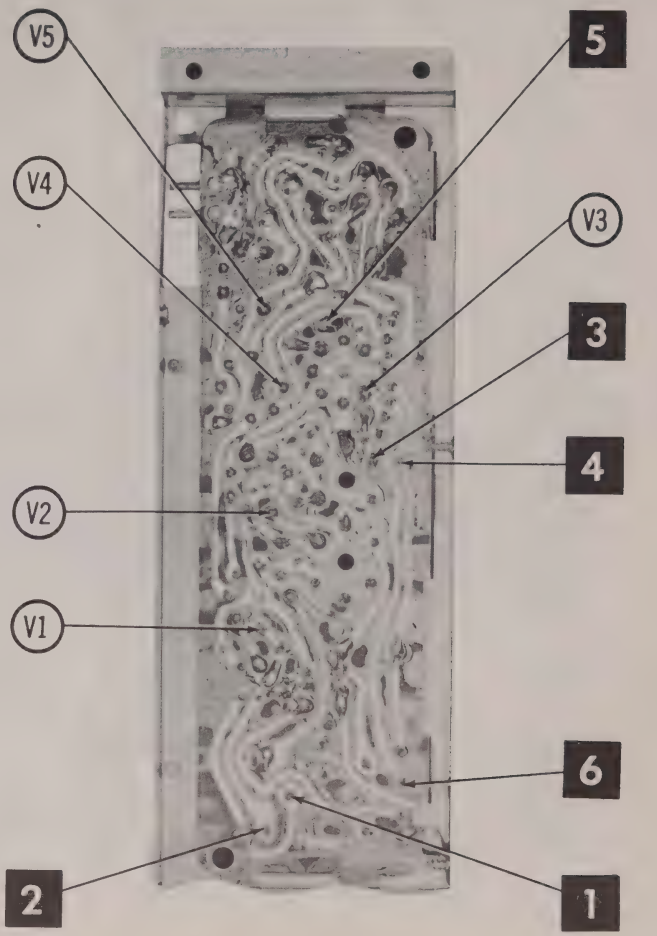
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | SILVERTONE PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | 45534-1 | | | BC-419 | | | |
| L2 | Osc Coil | 43644-1 | | | | | | |
| L3 | Input IF Trans | 44282-1 | 16-6780 | 16-6780 | BC-356 | 13-PC9 | RF-4 | |
| L4 | Output IF Trans | 44282-1 | 16-6780 | 16-6780 | BC-357 | 13-PC10 | RF-4 | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordorson PART No. | Triad PART No. | |
| T1 | 2300Ω | 3-4Ω | 46700-4 | 24S53 | A-3025 | AU-605 | A-3332 | 24S53 | S-12X | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | SILVERTONE PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 6-8Ω | 46185-2 | 4AIRZ7 | |
| SP2 | 4" | PM | 6-8Ω | 46185-1 | 4AIRZ7 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | SILVERTONE PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap | 45533-1 | 2 Gang |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

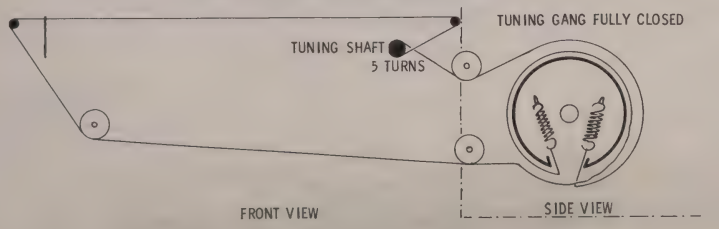
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 47217-1 | Tuning, Volume |
| Pointer | 47219-1 | |
| Cabinet Front | 47777-67 | Ivory, Includes Cabinet Front, Dial Crystal, and Inlays |
| Cabinet Rear | 45765-481 | Brown, Model 7 |
| Cabinet Rear | 47221-107 | Ivory, Model 8 |
| Cabinet Rear | 45765-831 | Coral, Model 9 |
| Cabinet Rear | 45765-951 | Ice Blue, Model 10 |

## WIRING DATA

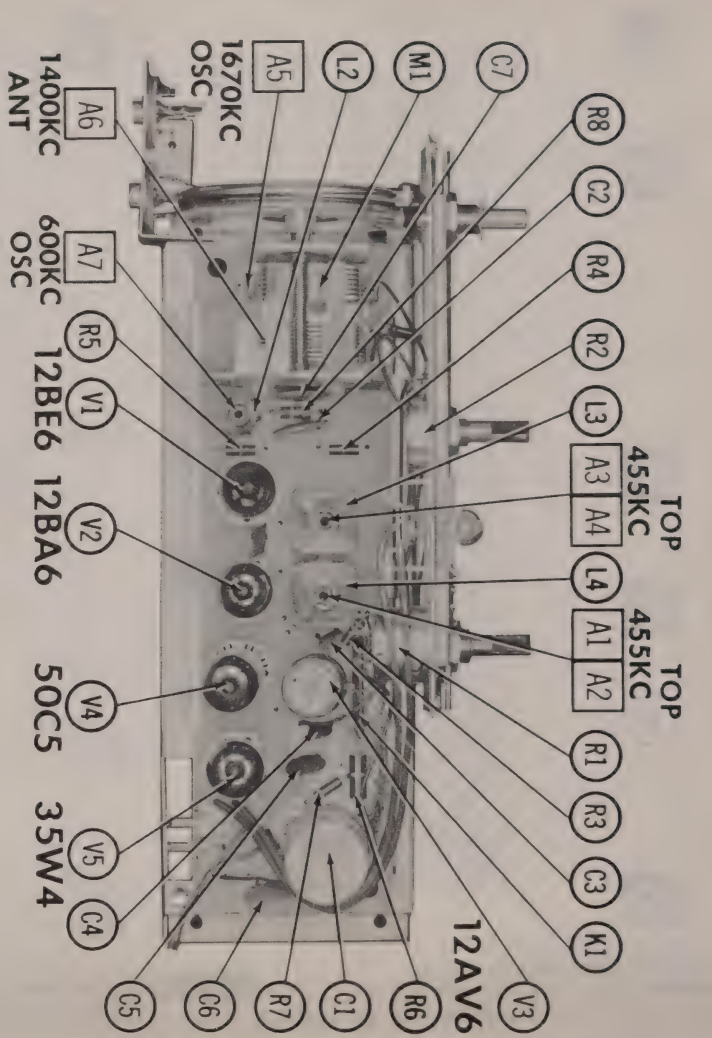
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

## DIAL CORD STRINGING




## CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE™

MODEL 211

| | |
|---|---|
| TRADE NAME | Silvertone Models 211, 212, 213 (Ch. 132.43601) |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois |
| TYPE SET | Battery Operated Transistorized Portable AM Receiver |
| POWER SUPPLY | 9 Volts DC |
| RATING | 7MA@9 Volts DC (No Signal, Min. Volume)<br>12MA@9 Volts DC (Signal, Normal Volume) |
| TUNING RANGE—BROADCAST | 540 – 1670KC |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A5.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis. | 455KC (400~ Mod.) | Tuning gang fully open. | Across voice coil. | A1, A2, A3 | Adjust for maximum output. |
| 2. | Loop | 1670KC | " | " | A4 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | " | 1400KC | Tune to 1400KC signal. | " | A5 | " |
| 4. | " | 600KC | Tune to 600KC signal. | " | A6 | Adjust for maximum output while rocking tuning gang. |

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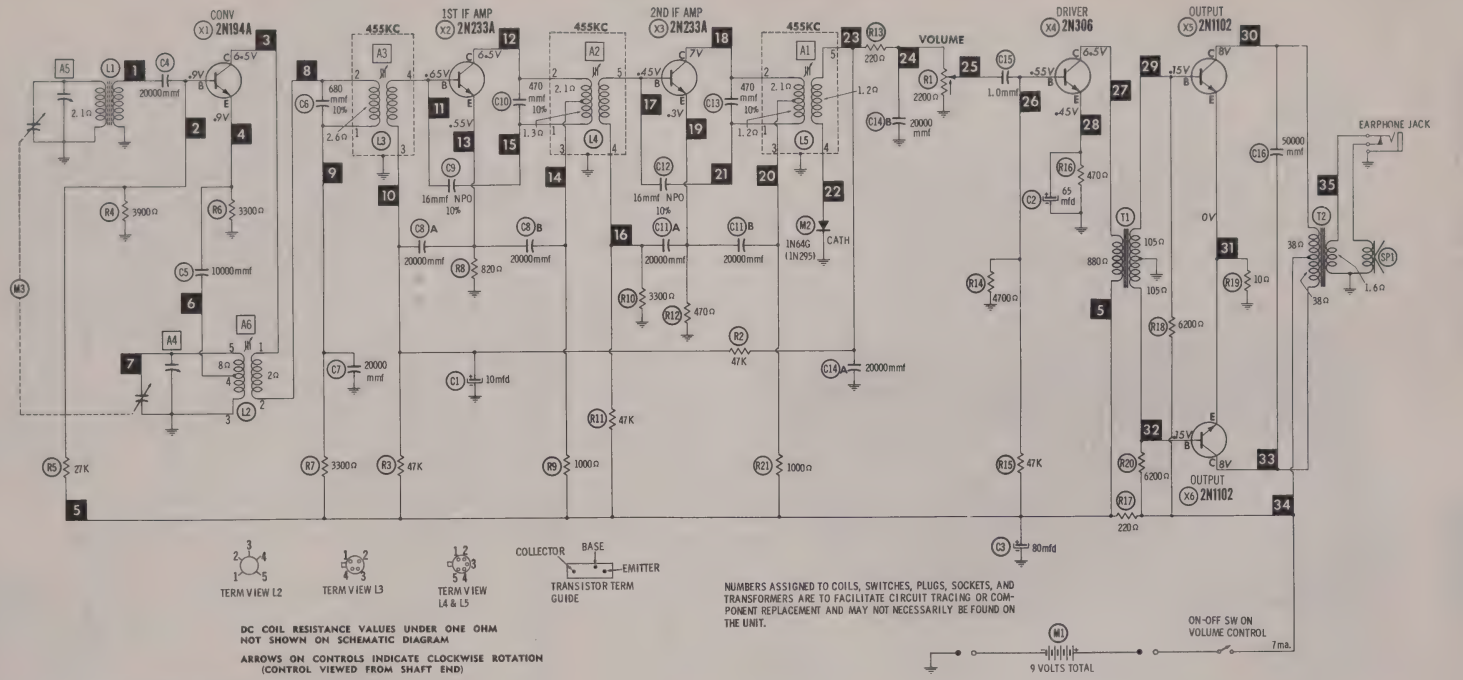
SILVERTONE MODELS 211,
212, 213 (Ch. 132.43601)
SET492 FOLDER 21




**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

**ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)**

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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**SILVERTONE MODELS 211, 212, 213 (Ch. 132.43601)**

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2N194A | Converter | 2N438 | | 2N1366 | 2N194 | NPN |
| X2 | 2N233A | 1st IF Amplifier | 2N438 | | 2N1367 | 2N233A | NPN |
| X3 | 2N233A | 2nd IF Amplifier | 2N438 | | 2N1367 | 2N233A | NPN |
| X4 | 2N306 | Driver | 2N306 | 2N649 | | 2N306 | NPN |
| X5 | 2N1102 | Output | 2N438A | 2N649 | | 2N1102 | NPN } Matched |
| X6 | 2N1102 | Output | 2N438A | 2N649 | | 2N1102 | NPN } Pair |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 10 | 10 | 44396-4 | PWE10010 | EC10-10 | TT12X10 | ML10-15 | TE-1114 | |
| C2 | 65 | 10 | 44396-3 | | | TT10X60 | | TE-1134 | |
| C3 | 80 | 10 | 44279-8 | | | | | VL-1127 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C4 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | 680 10% | | 1469-00068 | | 1R5T68 | CM-19B-681K | MCJ249 | MS-368 |
| C7 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C8A | 20000 | | BPD-2X02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-2S20 |
| B | 20000 | | | DD-203 | BYB6S2 | CCD-203 | GP120 | |
| C9 | 16 NPO 10% | | NPO-DI 15 | DTZ-15 | C10Q15C | CCTO-150 | CNO-415 | 10TCC-Q15 |
| C10 | 470 10% | | 1469-00047 | | 22R5T47 | CM-19B-471K | MCJ244 | MS-347 |
| C11A | 20000 | | BPD-2X02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-2S20 |
| B | 20000 | | | DD-203 | BYB6S2 | CCD-203 | GP120 | |
| C12 | 16 NPO 10% | | NPO-DI 15 | DTZ-15 | C10Q15C | CCTO-150 | CNO-415 | 10TCC-Q15 |
| C13 | 470 10% | | 1469-00047 | | 22R5T47 | CM-19B-471K | MCJ244 | MS-347 |
| C14A | 20000 | | BPD-2X02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-2S20 |
| B | 20000 | | | DD-203 | BYB6S2 | CCD-203 | GP120 | |
| C15 | 1.0 3V | #44684-9 | | UK-105 | | | | |
| C16 | 50000 | | BPD-05 | DD-503 | H-05S5 | | GP150 | 5HK-S50 |

# Silvertone Part Number.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | SILVERTONE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1 | 2200Ω | 1/4 | 45000-4 | | | | | Volume & Switch |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 47K | |
| R3 | 47K | |
| R4 | 3900Ω | |
| R5 | 27K | |
| R6 | 3300Ω | |
| R7 | 3300Ω | |
| R8 | 820Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 1000Ω | |
| R10 | 3300Ω | |
| R11 | 47K | |
| R12 | 470Ω | |
| R13 | 220Ω | |
| R14 | 4700Ω | |
| R15 | 47K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R16 | 470Ω | |
| R17 | 220Ω | |
| R18 | 6200Ω | |
| R19 | 10Ω | |
| R20 | 6200Ω | |
| R21 | 1000Ω | |

# PRINTED BOARD

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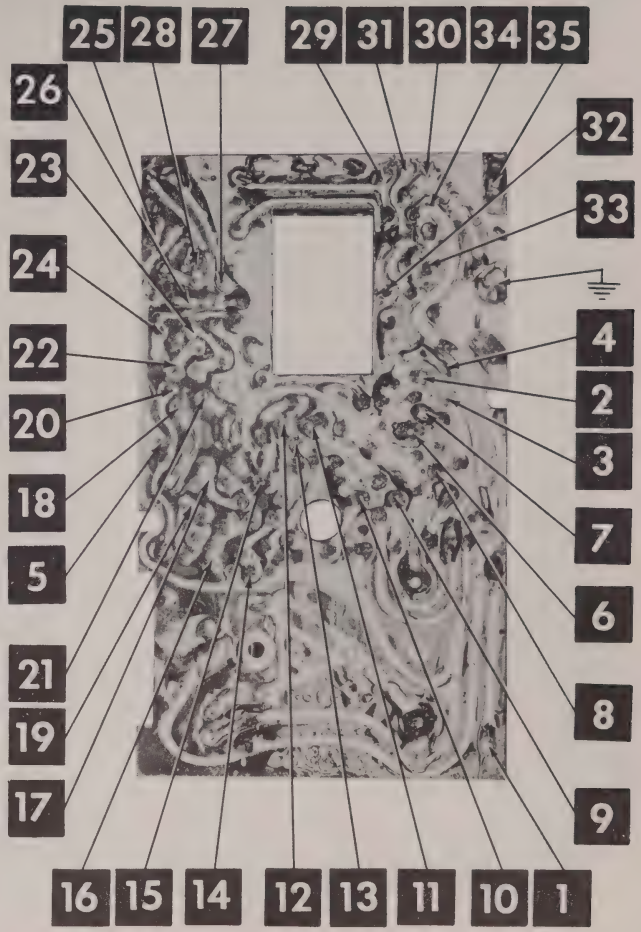


# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | SILVERTONE PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | 44511-4 | | | | | | |
| L2 | Osc. Coil | 45783-12 | | | | | | |
| L3 | 1st IF Trans. | 44855-15 | | | | | | |
| L4 | 2nd IF Trans. | 44855-16 | | | | | | |
| L5 | 3rd IF Trans. | 44855-17 | | | | | | |

## TRANSFORMER (DRIVER)

| ITEM No. | TURNS RATIO | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 1.5 | 1 | 45604-1 | TR-4 | | TA-28 | TR-4 | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 675Ω | 12Ω | 44858-3 | | | | TA-25 | | | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | SILVERTONE PART No. | QUAM PART No. | |
| SP1 | 2 3/4" | PM | 10-12Ω | 44280-1 | 27A06Z12 | |

## BATTERIES

| ITEM No. | VOLTAGE | SILVERTONE PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M1 | 9V | 6418 | | 2U6 | | 216 | | M-1604 | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | SILVERTONE PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M2 | 1N64G * | 43959 | 1N64 | 1N295 | 1N64 | Detector (Pigtail) |

* Some versions may use 1N295 in this application.

## MISCELLANEOUS

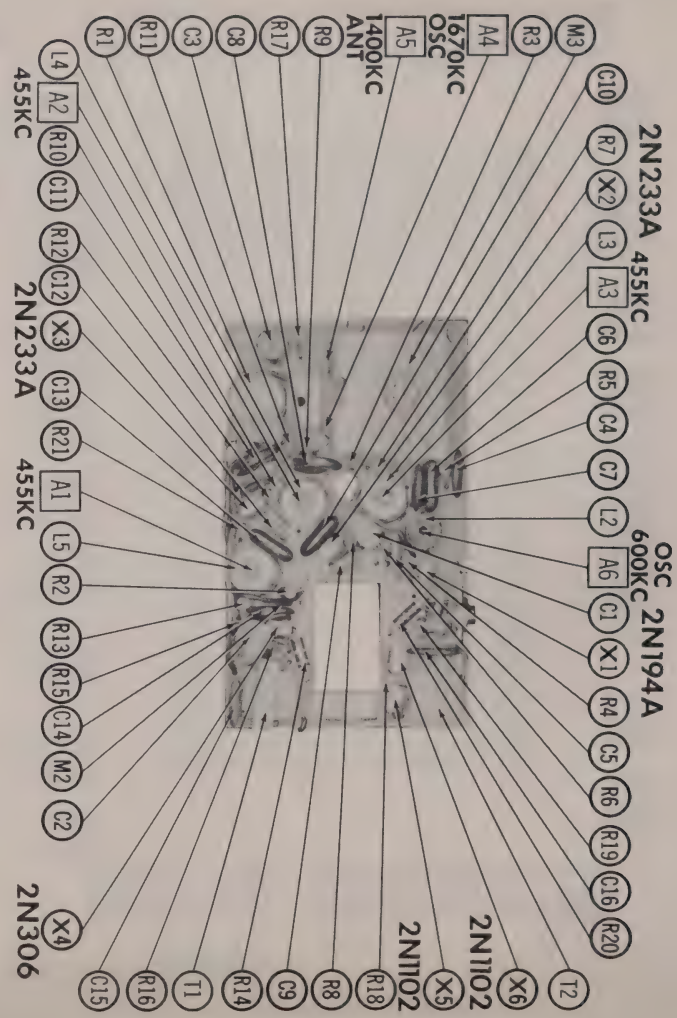
| ITEM No. | PART NAME | SILVERTONE PART No. | NOTES |
|---|---|---|---|
| M3 | Tuning Cap. | 47441 | 2 Gang |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 45571-95 | Tuning, Model 213 |
| Knob | 45571-83 | Tuning, Model 212 |
| Knob | 45571-29 | Tuning, Model 211 |
| Knob | 46422-95 | Off-On Volume, Model 213 |
| Knob | 46422-83 | Off-On Volume, Model 212 |
| Knob | 46422-29 | Off-On Volume, Model 211 |
| Cabinet Ass'y. | 47368-95 | Model 213 |
| Cabinet Ass'y. | 47368-83 | Model 212 |
| Cabinet Ass'y. | 47368-29 | Model 211 |
| Handle | 45572 | |

# CHASSIS—TOP VIEW



PHOTOFACT® Folder

# SILVERTONE MODELS 262A, 263A (Ch. 528.59650)

SILVERTONE MODELS 262A, 263A (Ch. 528.59650)

MODEL 263A

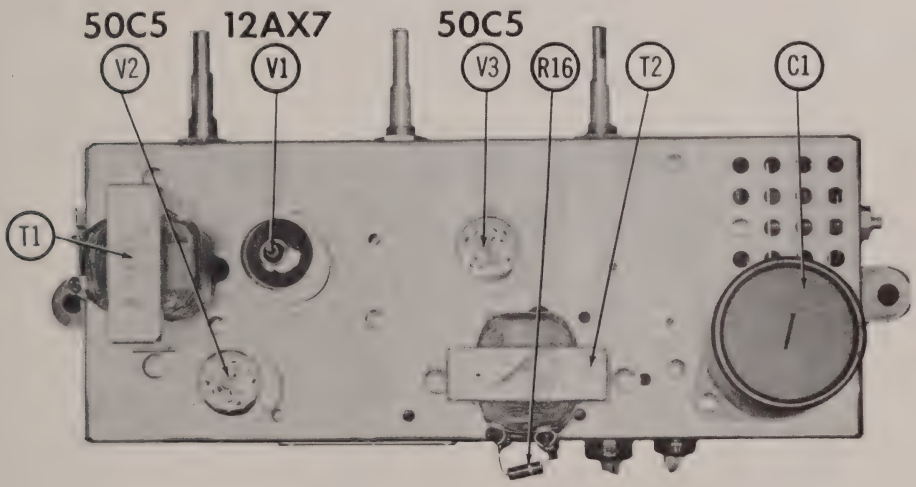
SILVERTONE MODELS 262A, 263A (Ch. 528.59650)

| | |
|---|---|
| TRADE NAME | Silvertone Models 262A, 263A, (Ch. 528.59650) |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois |
| TYPE SET | AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 31 Watts, .33 Amp @ 117 Volts AC (Less Motor) |

MODEL 262A USES RECORD CHANGER 528.56990 or 528.56991.

MODEL 263A USES RECORD CHANGER 528.56664 or 528.56665

FOR SERVICE INFORMATION, SEE SIMILAR SILVERTONE 528.56000 SERIES - PHOTOFACT SET 417 FOLDER 10




**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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SET492 FOLDER 22

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Left Channel AF Amp - Right Channel AF Amp | 12AX7 | V2<br>V3 | Left Channel Output<br>Right Channel Output | 50C5<br>50C5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | ▲150 | 150 | 18-60-3 | AFH4-99-25 | D0310 | FP420. 54 | TMQ-115 | TVL-3449 | |
| B | ■ 50 | 150 | | | BBR25-25 | TC492 | | TVA-1205 | |
| C | ▲ 25 | 25 | | | | | | | |
| D | 25 | 25 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | .047 | 400V | (.02) † | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C3 | 20000 | | (.047) † | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C4A | 5000 | | | BPD-2X0047 | DD3-502 | BYC6DD5 | CCD-502 | B2X250 | 5HK-2D47 |
| B | 5000 | | | | | | CCD-502 | | |
| C5 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C6 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C7 | 2000 | | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C8 | 330 | 10% | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C9 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C10 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C11 | 2000 | | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C12 | 330 | 10% | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C13 | .047 | 400V | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |

† Alternate Value.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | SILVERTONE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 2meg<br>900K tap | ½ | 24-332-0 | | | | | Loudness, Left Channel |
| B | 2meg<br>900K tap | ½ | | | | | | Loudness, Right Channel |
| R2A | 1meg | ½ | 24-211-2 | AB-70 | AD47-1meg-Z | | FB16A | Treble, Left Channel |
| B | 1meg | ½ | | SR-70 | Not Req. | | RU16A | Treble, Right Channel |
| C | Shaft | | | AK-8 | RS-3/16 | | CS687 & DS-37 | |
| R3A | 5meg | ½ | 24-212-2 | | | | FD56R | Bass, Left Channel |
| B | 5meg | ½ | | | | | RU56R | Bass, Right Channel |
| C | Shaft | | | | | | CS687 & DS-37 | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

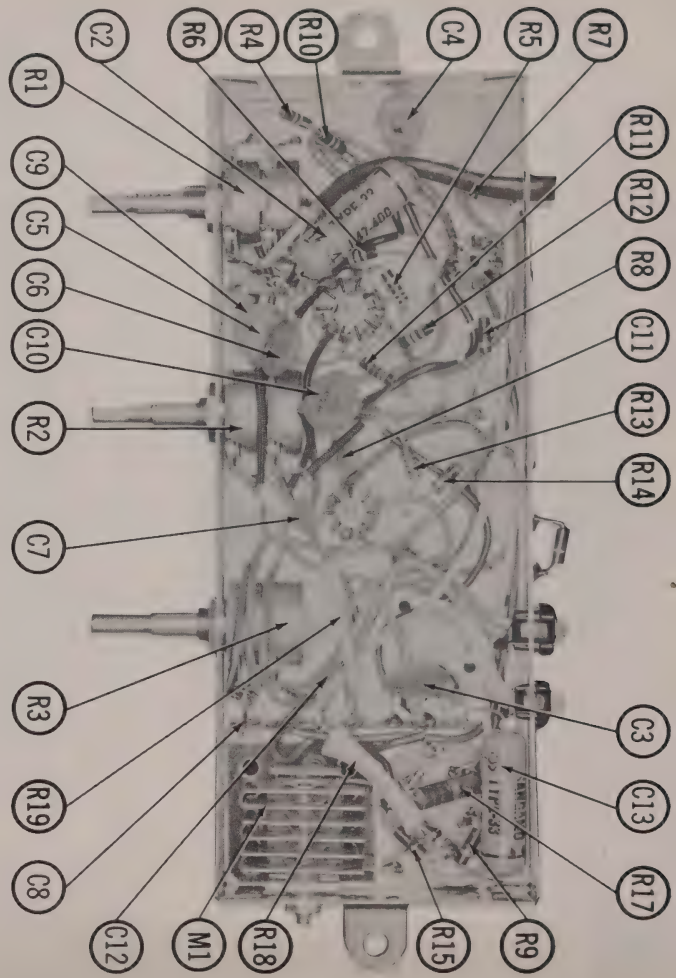
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 100K | |
| R5 | 4. 7meg | |
| R6 | 270K | |
| R7 | 470K | |
| R8 | 100Ω | |
| R9 | 120Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 100K | |
| R11 | 4. 7meg | |
| R12 | 270K | |
| R13 | 470K | |
| R14 | 100Ω | |
| R15 | 120Ω | |

| ITEM No. | RATING | | REMARKS |
|---|---|---|---|
| R16 | 220Ω | | |
| R17 | 2200Ω | 1W | #60-22211 |
| R18 | 27Ω | 2W | #61-145-0 |
| R19 | 53Ω | 2W | #61-169-0 |

#Silvertone Part Number

# CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA: SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 2600Ω | 6-8Ω | B80-78-1D ① | 22S86 | A-2903 | AU-603 | A-3849② | 22S86 | S-3X | |
| T2 | 2600Ω | 6-8Ω | B80-78-1D ① | 22S86 | A-2903 | AU-603 | A-3849② | 22S86 | S-3X | |

① Alternate Part #80-78-1
② Drill new mounting holes.

## SPEAKER

| ITEM No. | TYPE: SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA: SILVERTONE PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" | PM | 6-8Ω | 33-386-4A * | 6A2IZ8 | *Used in model 263A |
| SP2 | 6" | PM | 6-8Ω | 33-386-4A * | 6A2IZ8 | ♦Used in model 262A |
| | 5-1/4 | PM | 6-8Ω | 33-405-4 ♦ | 5A1Z7.1 | |
| | 5-1/4 | PM | 6-8Ω | 33-405-4 ♦ | 5A1Z7.1 | |

## RECTIFIERS

| ITEM No. | RATING: CURRENT (Measured) | REPLACEMENT DATA: SILVERTONE PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .070A | 86-15-3 ① | Rs150 ① | 1235AH ① | 150 ① | SR200 ② | ① Selenium<br>② Silicon |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA: SILVERTONE PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M2 | 33-311-0 ① | 13TB | | 26S | S1-1 & S3-3 | 53 | | 8TA4-S | N-8TA-S |
| | 33-318-0 ② (Includes needle) | | | | | | | | |

① Model 263A
② Model 262A

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA: SILVERTONE PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M3 | 83-1252-0 ① (LP) | W-102MGS † or W-102MGD ♦ | E98X † or E98XD ♦ | † Jewel ♦ Diamond<br>① Model 263A |
| | 83-125-0 ① (78RPM) | W-101STS † or W-101STD ♦ | E98 † or E98D ♦ | |

## MISCELLANEOUS

| ITEM No. | PART NAME | SILVERTONE PART No. | NOTES |
|---|---|---|---|
| M4 | Switch | 69-282-0 | Stereo - Monaural (Part of Changer) |
| M5 | Switch | 84-7838 | Off-On (Part of Changer) |
| M6 | Motor | 59-162 | Phono Drive (Part of Changer) Chassis 528.56664, 990 |
| | Motor | 59-158 | Phono Drive (Part of Changer) Chassis 528.56665, 991 |

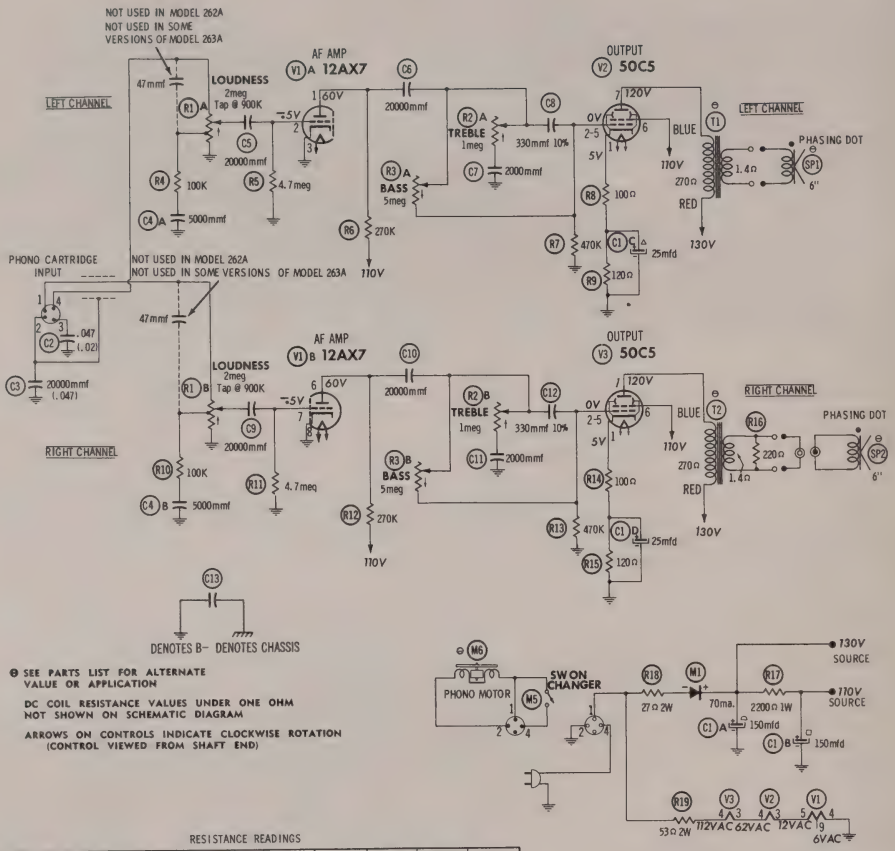
## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 52-1256-0 | Loudness, model 263A |
| Knob | 52-1266-0 | Loudness, model 262A |
| Knob | 52-1254-0 | Treble, model 263A |
| Knob | 52-1258-0 | Treble & Bass, model 262A |
| Knob | 52-1255-0 | Bass, model 263A |
| Knob | 52-1240-0 | Balance, model 263A |
| Knob | 52-1244-0 | Balance, model 262A |
| Knob | 52-1237-0 | Off-On Reject, model 263A (Part of Changer) |
| Knob | 52-1120-0 | Off-On Reject, model 262A (Part of Changer) |
| Knob | 52-1238-0 | Speed Control, model 263A (Part of Changer) |
| Knob | 52-918-0 | Speed Control, model 262A (Part of Changer) |
| Cabinet | 42-99-2 | Model 263A |
| Cabinet | 21-115-1 | Stereo Speaker, model 263A |
| Cabinet | 42-115-2 | Stereo 262A |
| Handle | 49-517 | Stereo 263A (Includes Hardware) |
| Handle | 49-469 | Stereo 262A |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |




**Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION**

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

**ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)**

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †270K | 4.7meg | 0Ω | 0Ω | 12Ω | †270K | 4.7meg | 0Ω | 6Ω |
| V2 | 50C5 | 220Ω | 470K | 12Ω | 62Ω | 470K | †2200Ω | †270Ω | | |
| V3 | 50C5 | 220Ω | 470K | 62Ω | 112Ω | 470K | †2200Ω | †270Ω | | |

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of components values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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**SILVERTONE MODELS 262A, 263A (Ch. 528.59650)**

PHOTOFACT® Folder with CIRCUITRACE®

**TOSHIBA**
**MODEL 3TP-315Y**

TOSHIBA
MODEL 3TP-315Y

TOSHIBA
MODEL 3TP-315Y

| | |
|---|---|
| TRADE NAME | Toshiba Model 3TP-315Y |
| MANUFACTURER | Transistor World Corp., 52 Broadway, New York 4, N. Y. |
| TYPE SET | Battery Operated Transistorized Portable AM Receiver |
| POWER SUPPLY | 3 Volts DC |
| TUNING RANGE—BROADCAST | 530 - 1650KC RATING 3 MA @ 3 Volts DC |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2.....GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A3, A4.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | Loop | 455KC (400~ Mod.) | Tuning gang fully open. | Across earphone thru AC probe | A1, A2 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 2. | " | 1650KC | " | " | A3 | " |
| 3. | " | 1400KC | Tune to 1400KC signal. | " | A4 | Adjust for maximum output while rocking tuning gang. |

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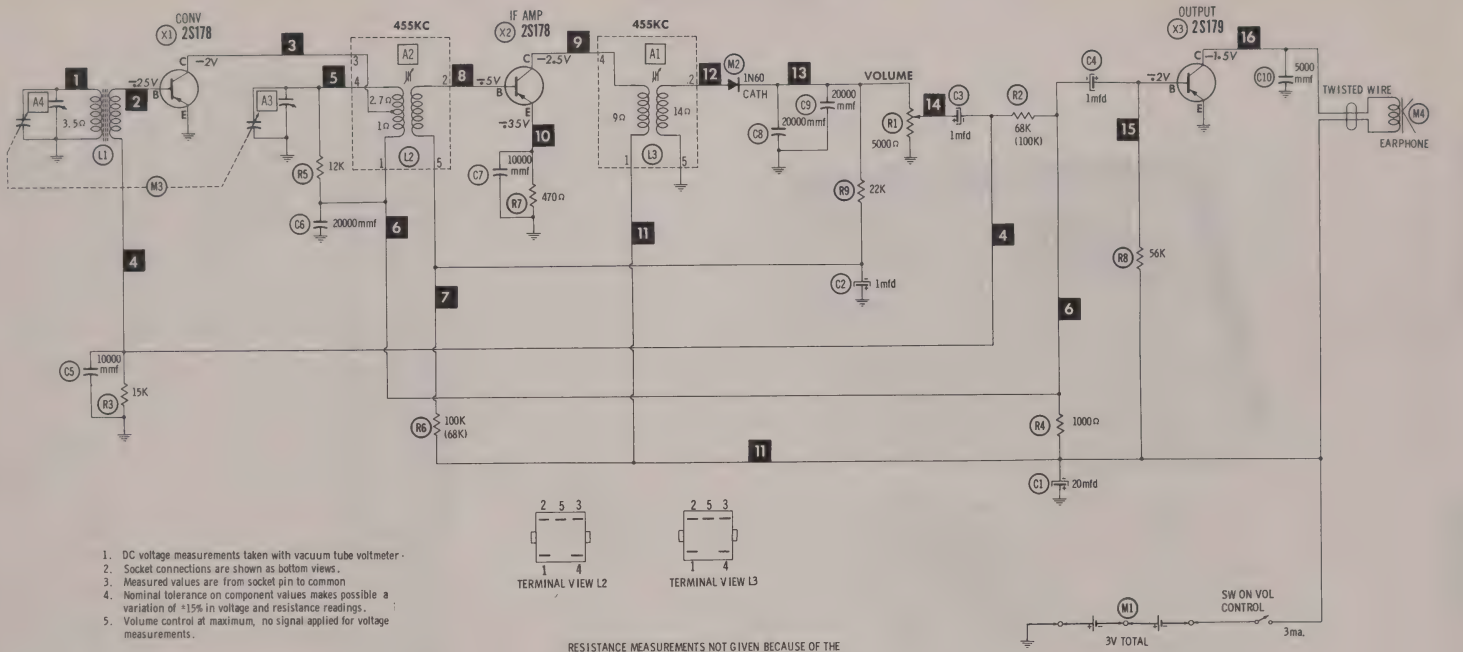
JF711



SET 492 FOLDER 23




1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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**TOSHIBA**
**MODEL 3TP-315Y**

# PARTS LIST AND DESCRIPTIONS

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2SI78 | Converter | | | 2N484 | | PNP |
| X2 | 2SI78 | IF Amplifier | | | 2N484 | | PNP |
| X3 | 2SI79 | Output | | 2N408 | 2N631 | | PNP |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | TOSHIBA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 20 | 3 | 3M20E | XPP-3020 | NLW20-6 | TT3X25 | ML20-6 | TE-1054 | |
| C2 | 1 | 10 | 10M1E | XPP-10001 | | TT12X1 | ML1-15 | TE-1120 | |
| C3 | 1 | 10 | 10M1E | XPP-10001 | | TT12X1 | ML1-15 | TE-1120 | |
| C4 | 1 | 10 | 10M1E | XPP-10001 | | TT12X1 | ML1-15 | TE-1120 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C5 | 10000 | | C80V103AM | DDM-103 | H-05S1 | | TA-110 | TG-S10 |
| C6 | 20000 | | C80V203AM | DDM-203 | H-05S2 | | TA-120 | TG-S20 |
| C7 | 10000 | | C80V103AM | DDM-103 | H-05S1 | | TA-110 | TG-S10 |
| C8 | 20000 | | C80V203AM | DDM-203 | H-05S2 | | TA-120 | TG-S20 |
| C9 | 20000 | | C80V203AM | DDM-203 | H-05S2 | | TA-120 | TG-S20 |
| C10 | 5000 | | C80V502AM | DDM-502 | H-05D5 | CCD-502 | TA-250 | TG-D50 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | TOSHIBA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1 | 5000Ω | 1/4 | 40288T | | | | | Volume & Switch |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 68K | (100K) * |
| R3 | 15K | |
| R4 | 1000Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 12K | |
| R6 | 100K | (68K)* |
| R7 | 470Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R8 | 56K | |
| R9 | 22K | |

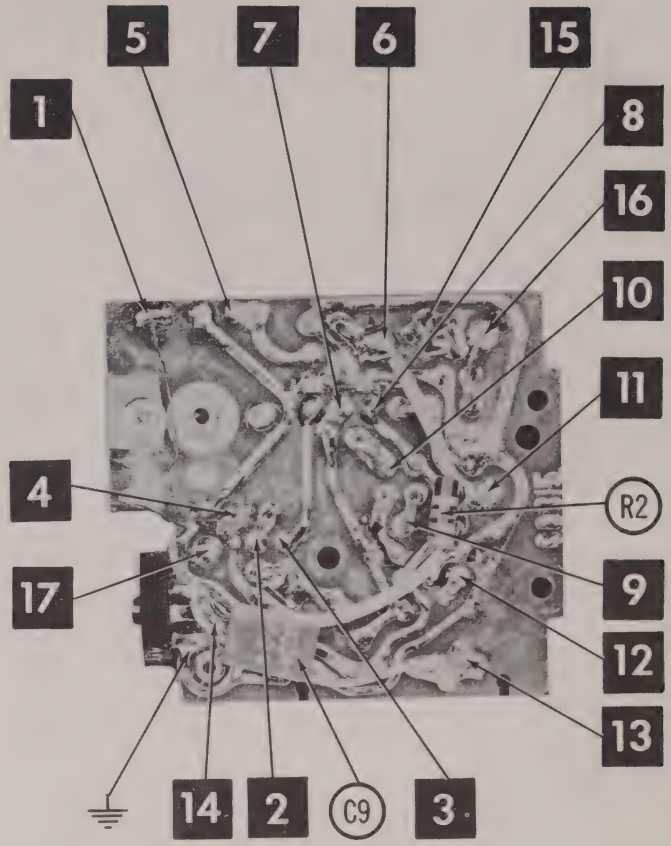
* Alternate Value.

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | TOSHIBA PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | LH-203 | | | | | | |
| L2 | Osc. Coil-Input IF | RT-1001 | | | | | | |
| L3 | Output IF | RT-1002 | | | | | | |

# PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



## PARTS LIST AND DESCRIPTIONS (Continued)

### BATTERIES

| ITEM No. | VOLTAGE | TOSHIBA PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M1 | 1.5V | UM-3 * | | 1 * | | 935 * | | M-14R * | * 2 Used |

### CRYSTAL DIODES

| ITEM No. | ORIG TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | TOSHIBA PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M2 | 1N60 | 1N60 | 1N60 | 1N60 | 1N60 | Detector (Pigtail) |

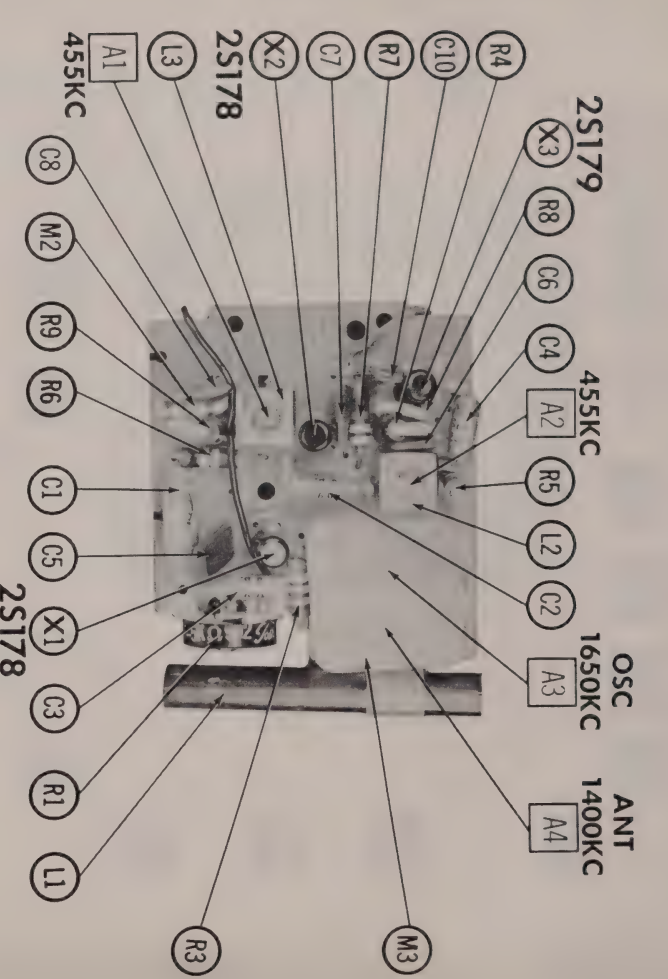
### MISCELLANEOUS

| ITEM No. | PART NAME | TOSHIBA PART No. | NOTES |
|---|---|---|---|
| M3<br>M4 | Tuning Cap.<br>Ear Phone | VC-2028 | 2 Gang |

### WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire ..... | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |

## CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

TRAV-LER
MODEL TT591

TRAV-LER
MODEL TT591

## GENERAL INFORMATION

The Trav-ler Model TT591 is a dual-track tape recorder, which doubles the playing and recording time.

The function controls of the tape-transport mechanism are push buttons located on the left side of the recorder. The Model TT591 tape recorder has a record level indicator, program indicator, amplifier and speaker output jacks, and microphone and radio-phono input jacks.

This recorder will operate at two speeds, 7 1/2 and 3 3/4 ips.

When both tracks are used, the recording and playing times are as follows:

| Reel Size | 3 3/4" | 7 1/2" |
|---|---|---|
| 5" (600 ft.) | 1 hour | 1/2 hour |
| 7" (1200 ft.) | 2 hours | 1 hour |

This recorder operates from a 60-cycle, 110-120 volt AC supply only. Before connecting to your line supply, be absolutely certain it agrees with these specifications.

Manufactured by:

Trav-ler Radio Corporation
571 W. Jackson Blvd.
Chicago 6, Illinois

SET 492 FOLDER 24

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

CQ426

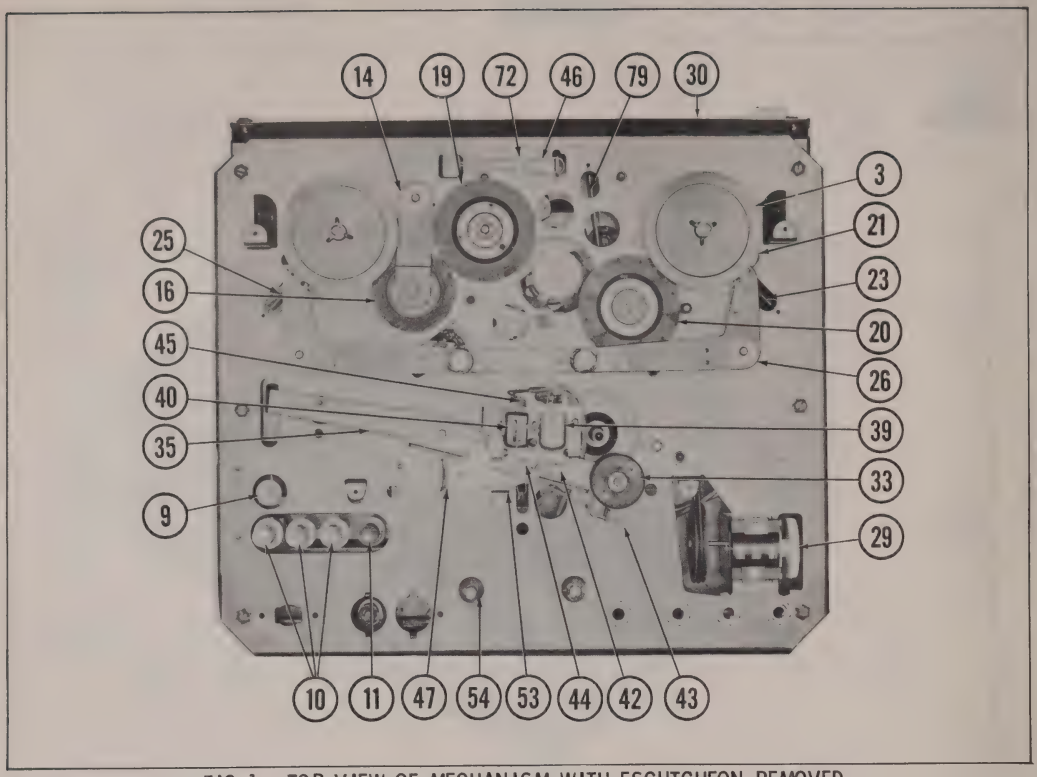



FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

## PREPARING FOR OPERATION

1. Place recorder in a convenient place, where it can get enough ventilation.
2. Remove lid from carrying case.
3. Remove all supplies from the storage compartment.
4. Plug the AC cord into a convenient AC outlet of proper rating.

## FUNCTION OF CONTROLS

### Stop

Depress the Stop button to stop the mechanism in any mode of operation. This button must be depressed when the recorder is not in use.

### Forward

Depressing the Forward button rapidly advances the tape to any desired section.

### Rewind

Depressing the Rewind button rapidly rewinds the tape from the take-up to the supply reel.

### Play

Depressing the Play button moves the tape against the head, and the pressure roller against the capstan. This button releases the brakes, causing take-up idler wheel (83) to contact clutch wheel assembly (89). This action turns the take-up spindle and reel.

### Record

Depressing the Record and Play buttons at the same time places the recorder in Record.

### Speed Change

Move the Speed Change shaft up for 3 3/4 ips, down for 7 1/2 ips. Make sure the Stop button is depressed before moving the shaft.

### Program Counter

The program counter is useful for logging material as it is recorded, or for locating previously logged material. Set the indicator at "000" at the start of a reel of tape; any desired section on the tape can then be located.

### On-Off and Volume

Turning this control clockwise, until a click is heard, turns the recorder on. Further rotation increases the volume.

### Tone

Turning this control clockwise regulates the tone to any desired listening level.

### Record Level Indicator

Adjust the volume so the Record Level Indicator flashes on peaks of the sound level.

### Amplifier Output

The amplifier output permits an external amplifier to be connected to the recorder.

### Speaker Output

A speaker of 4-8 ohms impedance can be connected to the recorder by inserting the speaker plug into the Speaker Output jack. The internal speaker of the recorder is automatically disconnected when an external speaker is used.

### Radio-Phono Input

The Radio-Phono input permits a radio, phonograph or television receiver to be connected to the recorder by means of a patch cord (available as an accessory). Thus, programs from a radio or television receiver, or a record from a phonograph, can be recorded directly from the unit.

### Microphone Input

The microphone is inserted into the Microphone jack , so recordings can be made from any source.

## OPERATING INSTRUCTIONS

### Threading the Tape

1. Be sure the Stop button is depressed.
2. Place a reel of tape on the left spindle and an empty reel on the right spindle.
3. Unwind about two feet of tape. Hold a section taut, and insert it into the tape slot.
4. Put the free end of the tape into one of the slots in the empty reel. Turn the reel counterclockwise several times to secure the tape to it.

### To Record

1. Thread the tape (see "Threading the Tape").
2. To record from the microphone, plug it into the Mic input jack. To record from a radio, phonograph, or television receiver, connect the Radio-Phono cord to the speaker terminals, and plug the other end into the Radio-Phono input jack.
3. Turn the recorder on, and let the tubes warm up.
4. Depress the Record and Play buttons to start the tape moving.
5. After completing the recording, depress the Stop button.

### Erasing

A recording is automatically erased while a new one is being made. To erase a tape without putting a new recording on it, unplug all input connections, turn the Volume control to its lowest level, depress the Record button, and run the tape through the machine.

### Dual-Track System

After making a recording on one track of the tape, remove the reel from the right spindle, turn it over, and place it on the left spindle. Place an empty reel on the right spindle, and thread the tape. The second track is now ready to be used.

### To Play Back a Recording

1. Thread the tape (see "Threading the Tape").
2. Turn the recorder on, and let the tubes warm up.
3. Depress the Play button.
4. Adjust the Volume and Tone controls to the desired listening level.
5. Depress the Stop button after the recording has been played back.

### To Edit and Splice Tape

NOTE: Since one track cannot be edited and spliced without affecting the other track, recordings to be edited should be limited to one track only.

1. Tape can be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements, etc., can be inserted between selections.

   Unused tape can be spliced for re-use.

2. For best results, cut the tape at a slight diagonal, join the ends with a butt joint, and fasten them on the glossy side with splicing tape. Trim off any excess width.

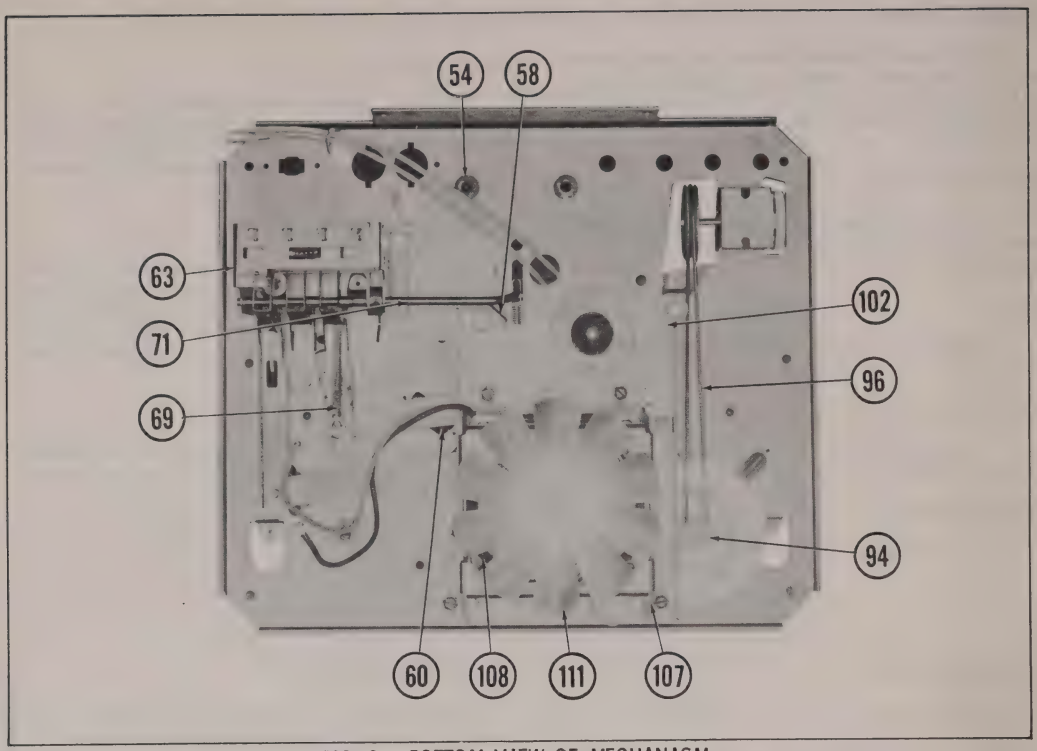



FIG. 2 BOTTOM VIEW OF MECHANISM

## DISASSEMBLY

### To Remove Recorder From Carrying Case

1. Remove the two reel spindles, held in place by Phillips head machine screws and flat washers.
2. Remove the Volume and Tone control knobs from their shafts.
3. Remove top plate (6), secured by 4 Phillips head machine screws. This will give access to the heads, pressure-pad assembly, idler drive wheels, upper linkage parts, program counter, and Record Level Indicator.
4. Place the recorder upright, and remove the two plastic feet held in place by the Phillips head machine screws at the back. Remove the two screws at the front of the carrying case.
5. Lift the mechanism from the case, being careful not to damage the speaker cones.

### To Remove Amplifier From Tape Transport

1. Disconnect all plug-in leads.
2. Disconnect the slide-switch wire link from the switch by first loosening the 3/8-inch switch position adjustment nut.
3. Unsolder the leads to the On-Off switch and the interlock muting switch.
4. Unscrew the volume and tone control locking nuts.
5. Remove the six 1/4-inch self-tapping screws and flat washers along the bottom and top of the printed circuit board.
6. Remove the locking nuts from the Microphone and Radio-Phono input jacks and from the speaker and Amplifier output jacks.
7. Remove the Record Level Indicator from the tape-transport deck.
8. Remove the amplifier assembly, using care not to damage the printed board.

### Removal of Mechanism Plate Assembly

1. Disconnect the leads of drive motor (108) by removing the solderless connectors.
2. Remove the six 5/16-inch self-tapping screws that hold the main mechanism plate to each speaker mounting plate. Remove the main mechanism plate.

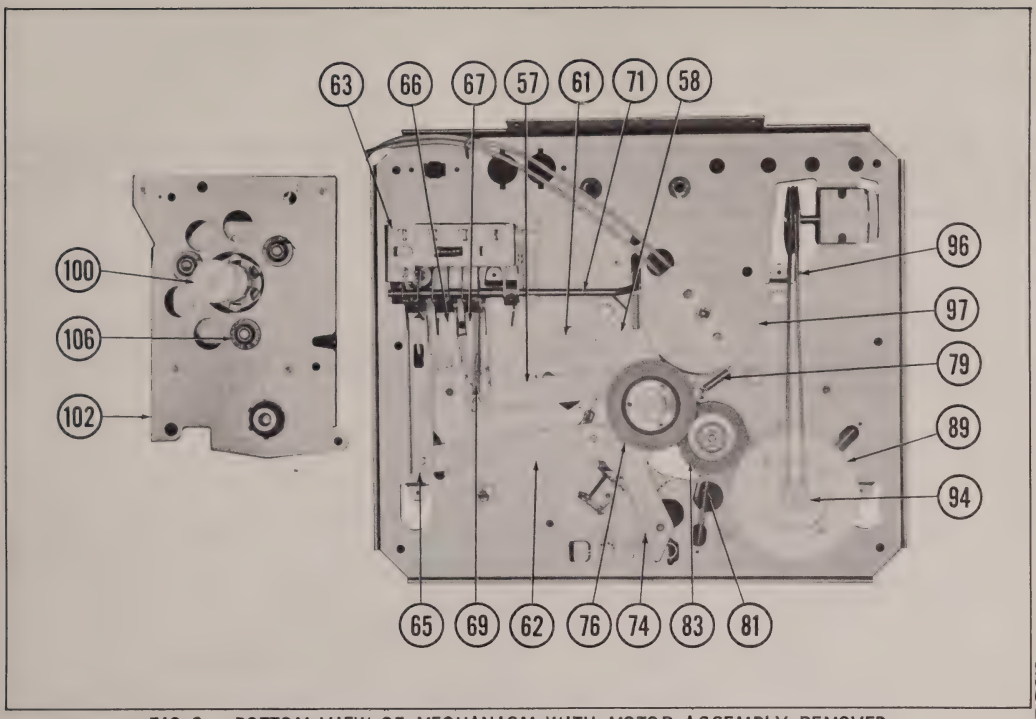



FIG.3 BOTTOM VIEW OF MECHANISM WITH MOTOR ASSEMBLY REMOVED

## ADJUSTMENTS

### Improper Tracking of Tape Reels

The feed and take-up plastic reel spindles are identical. They are mounted on a flanged shaft, and held in place by Phillips head screws and flat washers. If the plastic reel spindles wear to where the tape scrapes on the reels, shim washers can be added between the reel and flange shaft until the reels are properly aligned. Always depress the Play button whenever replacing the spindles, in order to prevent damaging the cork brake lining.

### Pressure Roller

Connect an inch-ounce scale to the end of pressure roller level assembly (35). Pull the pressure roller free from the capstan. If the reading is less than 16 inch-ounces, bend pressure roller spring (43) to increase the pressure.

### Take-up Tension

Place an empty 7-inch reel on the take-up spindle. Attach a short loop of string to the outside reel edge. Connect a gram scale (with a minimum reading of 60 grams) to the string. Hold the scale parallel to the recorder and at right angles to the take-up spindle. Depress the Play button and note the reading. If it is above or below 60 grams, remove the mechanism from the case, as described under "Disassembly".

Next remove the back mechanism plate, secured in place by the six Phillips head sheet metal screws. Disengage the counter drive belt from clutch pulley (94). Remove the pulley, secured by a 8/36 x 3/16" set screw. Clutch spring (92) and clutch lining (90) can now be slipped off take-up spindle shaft (87). If the reading was over 60 grams, the felt should be saturated in a solution of one part No. 31 turbine oil and 15 parts carbon tetrachloride. After saturation, allow the felt to dry for 30 minutes before reassembling the clutch. If the reading was less than 30 grams, replace the tension spring and/or felt, as required.

After reassembly, engage the counter drive belt properly in order that the counter will count when the Play or Forward button is depressed.

Recheck the tape recorder for proper operation after completing the servicing.

### Record-Play Head

1. Remove removable cover (4).
2. Thread an alignment tape on recorder.
3. Depress the Play push button.
4. Loosen the head mounting nuts, and move the head up and down and back and forth until maximum output is obtained.

5. Hold the head in this position and tighten the nuts.

## CLEANING

The record-playback and erase heads, the pressure pads, the pressure roller, and the capstan should be cleaned regularly with a soft cloth and alcohol. As the tape passes over the heads and between the pressure roller and capstan, oxide is worn from the tape and deposited on these parts. This oxide will cause faint recordings and playback, poor erasure, and wow if not removed.

## LUBRICATION

All bearings are of the Oilite type. Therefore, no further lubrication is necessary. When removing levers to make repairs on the tape-transport mechanism, use a clinging-type grease to lubricate these parts at the point where they slide in their slots or against each other.

## TROUBLE CHART

| Symptom | Cause | Remedy |
|---|---|---|
| Take-up reel does not revolve in Play or record position. | 1. Take-up idler spring (81) off or broken. | 1. Replace take-up idler spring (81). |
| | 2. Oil on rim of take-up idler wheel (83). | 2. Moisten cloth in alcohol, and clean rubber rim. |
| | 3. Clutch slipping on clutch wheel assembly. | 3. Reposition clutch pulley (94) on shaft, and tighten Allen screw. |
| Take-up reel does not revolve in Fast Forward position. | 1. Oil on rim of fast forward idler wheel (20). | 1. Moisten cloth in alcohol and clean rubber rim. |
| | 2. Fast forward lever spring (69) off or broken. | 2. Replace fast forward lever spring (69). |
| | 3. Fast forward idler spring (56) off or broken. | 3. Replace fast forward idler spring (56). |
| Supply reel does not revolve in Rewind position. | 1. Oil on second rewind idler wheel (16) or rewind drive idler wheel (19). | 1. Moisten cloth in alcohol and clean rubber rims of wheels (16) and (19). |
| | 2. Rewind idler spring (60) off or broken. | 2. Replace rewind idler spring (60). |
| Reels do not stop when Stop button is depressed. | 1. Brake actuating spring (45) off or broken. | 1. Replace brake actuating spring (45). |
| | 2. Brake lining worn. | 2. Replace brake lining. |
| | 3. Brake lever (71) loose on shaft. | 3. Reposition brake lever (71), and tighten Allen screws. |
| Counter mechanism does not operate. | 1. Defective counter (29). | 1. Check gear teeth in counter for damage. Replace if necessary. |
| | 2. Counter belt (96) off or broken. | 2. Replace counter belt (96). |
| Wow or flutter. | 1. Improper pressure between capstan and pressure roller (33). | 1. See "Adjustments". |

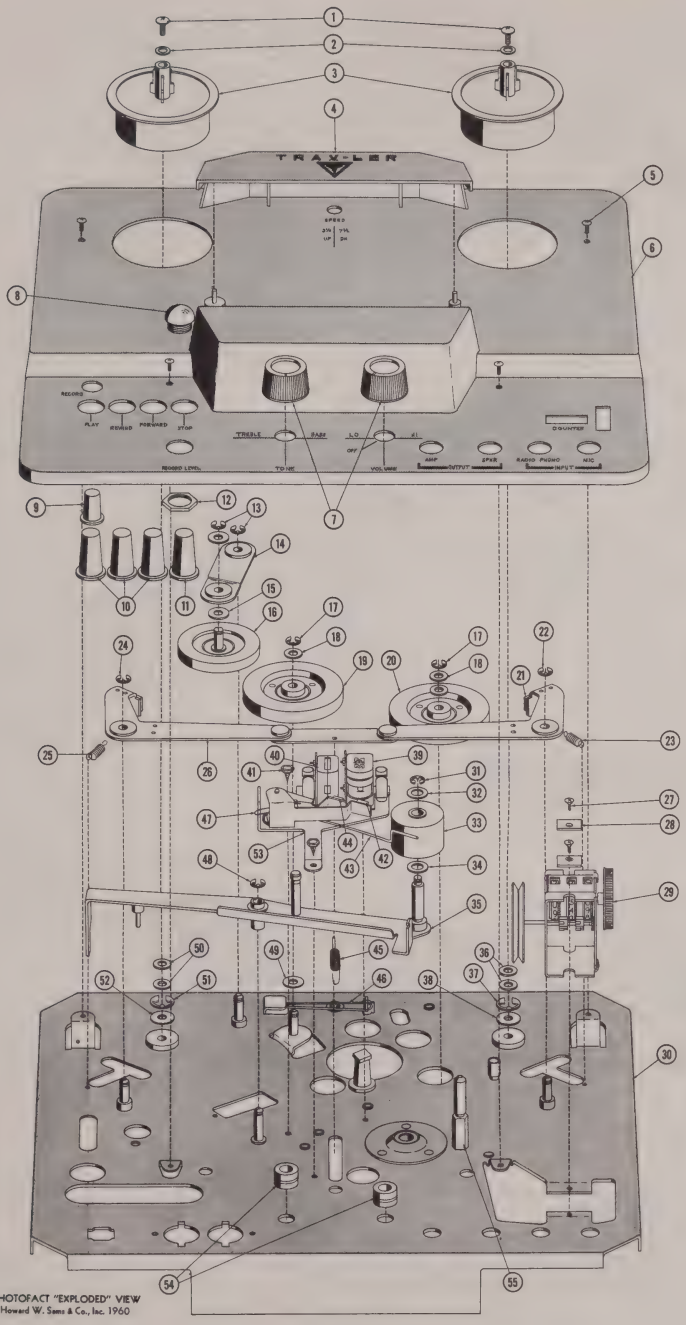



FIG.4A EXPLODED VIEW OF PARTS ABOVE PLATE ASSEMBLY

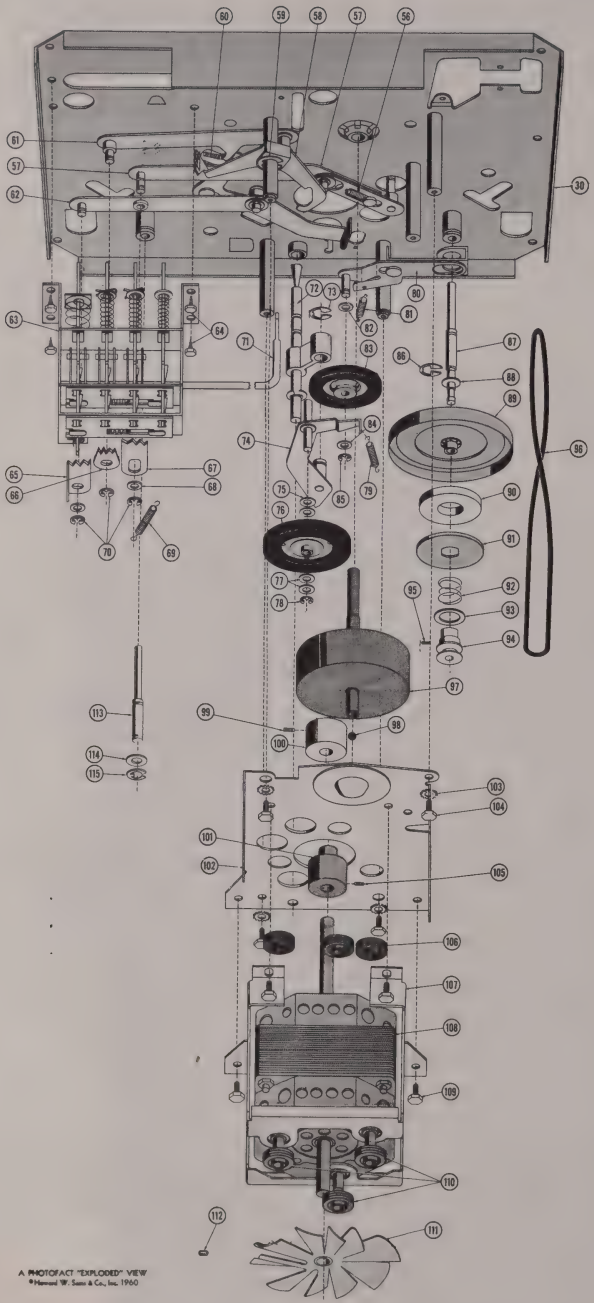
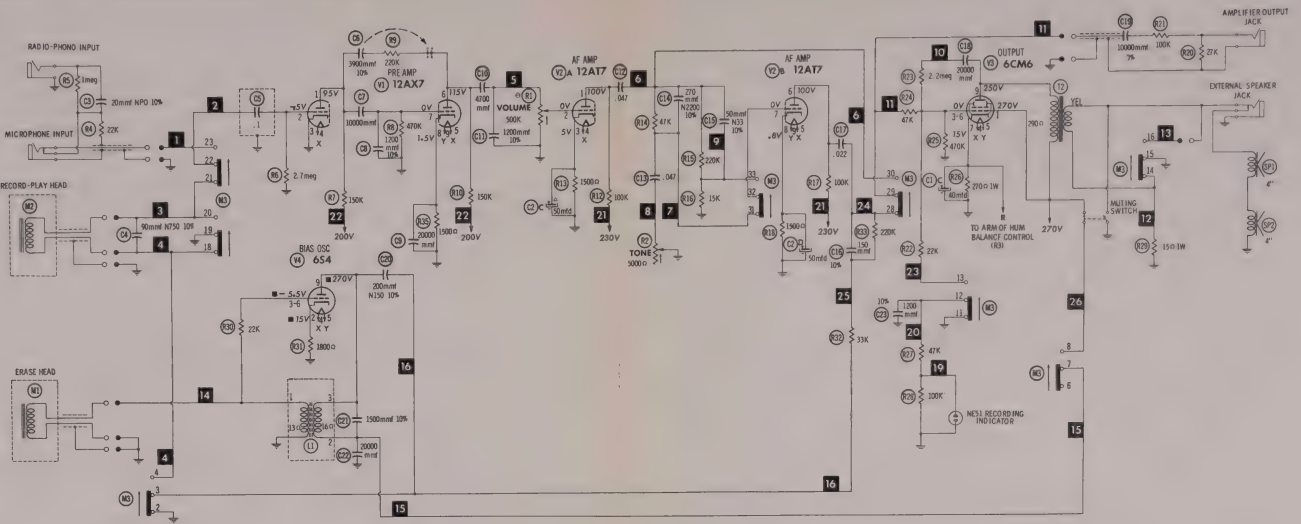
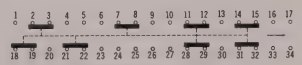



FIG.4B EXPLODED VIEW OF PARTS BELOW PLATE ASSEMBLY



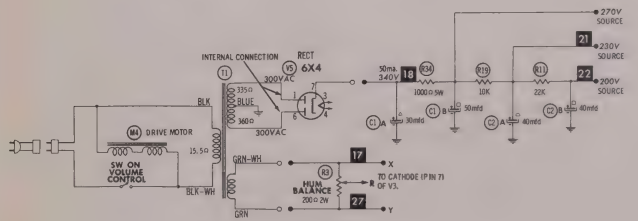

RECORD-PLAY SWITCH (M3) SHOWN IN "PLAY" POSITION.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 ECC83 | ↑180K | 2.7meg | 0Ω | 330Ω | 330Ω | ↑180K | 470K | 1500Ω | 330Ω |
| V2 | 12AT7 | ↑110K | 0Ω | 1500Ω | 330Ω | 330Ω | ↑110K | 270K 15K | 1500Ω | 330Ω |
| V3 | 6CM6 | ↑1000Ω | NC | 280K ●260K | 330K | 330K | 280K ●260K | 270Ω | NC | ↑1300Ω |
| V4 | 6S4A | NC | 1800Ω | 22K | 330Ω | 330Ω | 22K | NC | NC | ↑●1000Ω |
| V5 | 6X4 | 335Ω | NC | 330Ω | 330Ω | NC | 360Ω | ¶ | | |

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 7 OF V5.
● MEASURED IN "RECORD" POSITION. NC NO CONNECTION




● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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TRAV-LER MODEL TT391

A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

TROUBLE CHART (CON'T.)

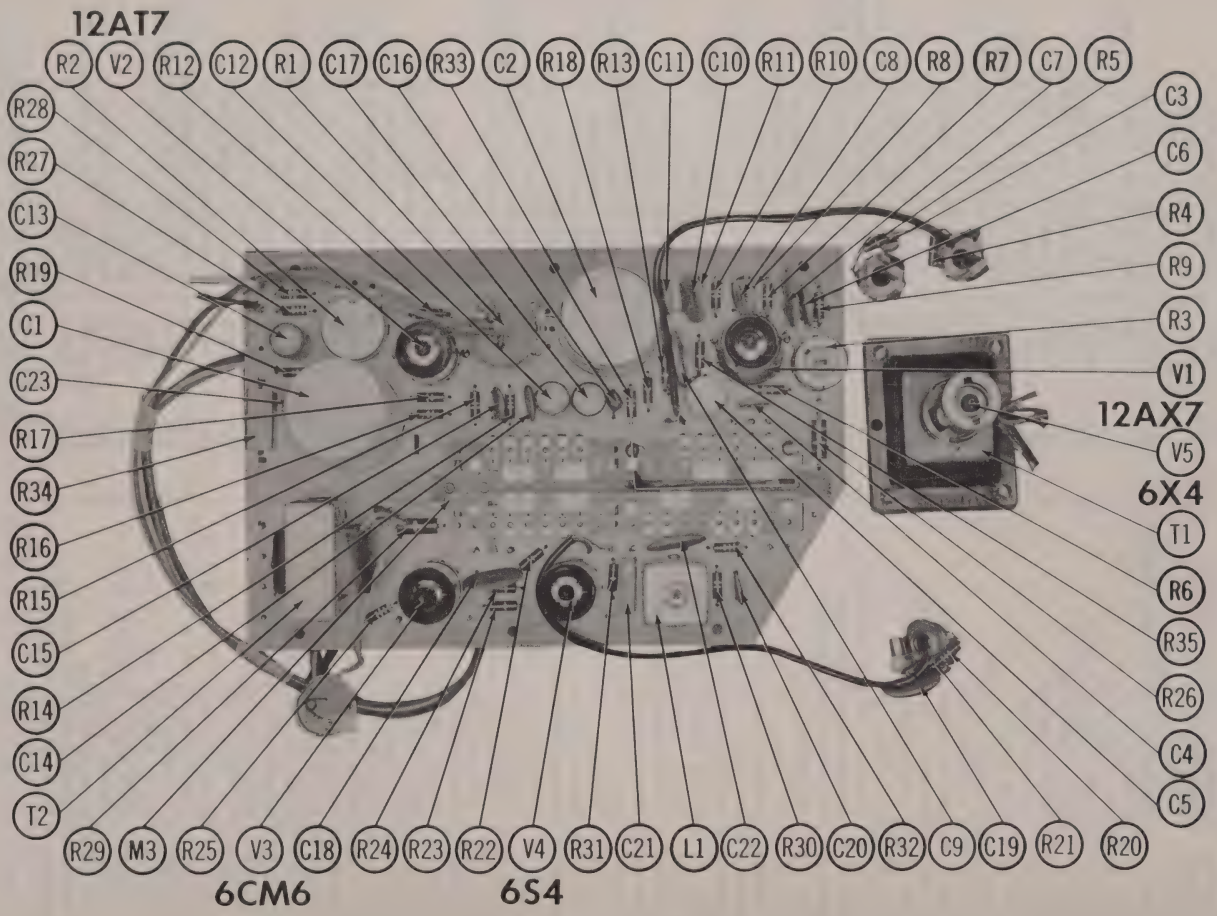
| Symptom | Cause | Remedy |
|---|---|---|
| | 2. Excessive take-up tension. | 2. See "Adjustments". |
| | 3. Counter (29) binding. | 3. Check for dirt or chips in gears and for scored shaft. Clean and lubricate. |
| | 4. Dirty pressure pads (42) and (44). | 4. Saturate pads with alcohol. Brush contact surfaces in direction of normal tape travel. |
| | 5. Pressure roller (33) binding on shaft, or damaged. | 5. Remove pressure roller (33) and clean bearing with pipe cleaner dampened with alcohol. Clean roller stud; if scored, polish with crocus cloth. Apply a light coating of nonmelting grease to the stud before reassembling. If damaged, replace. |
| | 6. Scored capstan and flywheel shaft (97) or bearings. | 6. If shaft is only lightly scored, polish with crocus cloth. If bearings are badly scored, replace. |
| | 7. Worn speed change idler wheel assembly (76). | 7. Some dents in the driving surface can be removed by press- |

TROUBLE CHART (CON'T.)

| Symptom | Cause | Remedy |
|---|---|---|
| | | ing the flat side of a screwdriver blade against the tire while the wheel is revolving. If tire is nicked or torn, replace wheel assembly. |
| | 8. Bent fan (111) blades or motor shaft. | 8. Place fan (hub up) on a flat surface. The ends of all blades should contact the surface. If any blades are out of alignment, reshape them. If motor shaft is bent, replace motor. |
| Pitch of sound from prerecorded tape is low. | 1. Capstan drive mechanism is slipping. | 1. Remove top plate (6). Dampen a pipe cleaner with alcohol and clean all driving surfaces. Note: All driving surfaces can be reached through holes in mechanism plate (30). |
| Loss of high frequencies in Record and Playback. | 1. Pressure pads (42) and (44) loose or worn. | 1. Check spring tension of pressure-pad spring. If pressure pads are worn, replace. |
| | 2. Foreign matter collected in tape-guide channel. | 2. Remove caked matter with wooden or soft plastic probe. Wipe channel with pipe cleaner or cloth dampened with alcohol. |
| Loss of high frequencies from previously recorded tape. | 1. Record-Play head (39) improperly adjusted. | 1. See "Head Alignment". |
| Speed-change shaft binding. | 1. Lack of lubrication. | 1. Lubricate speed-change shaft. |
| Drive erratic on both speeds. | 1. Position of drive pulley (101) incorrect. | 1. Check position of drive pulley (101) on drive motor (108). There should be .218 inch from bottom of drive pulley to top of motor shell. |
| Thumping or scraping noise in Forward or Rewind position. | 1. Position of forward and rewind pulley (100) incorrect. | 1. If forward and rewind pulley (100) is too high on its shaft, it will scrape the underside of the top plate assembly; if too low, the Allen screw opening in the pulley will strike the rubber molded wheel. Readjust as necessary. |
| Clicking noise in Fast forward or Rewind. | 1. Damaged program counter. | 1. Check program counter for loose springs or lack of lubrication. If necessary, lubricate gear teeth. |
| Noisy push button. | 1. Lack of lubrication. | 1. Lubricate neoprene pads on push-button shafts. |
| Volume or tone controls are difficult to turn. | 1. Printed circuit assembly not centered. | 1. Reposition printed circuit assembly; align shafts in rubber grommets. |
| | 2. Lack of lubrication or "tacky" condition of rubber grommets. | 2. Check rubber grommets where control shafts pass thru main mechanism plate. Lubricate rubber grommets. |

| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | 700245 | Screw, 4-10 x 1/4 Truss Head Phillips |
| 2 | 700716 | Washer, .116 x .281 x .020 |
| 3 | 800423 | Reel Spindle |
| 4 | MP-172 | Removable Cover |
| 5 | 700245 | Screw, 4-40 x 1/4 Truss Head Phillips |
| 6 | 800504 | Top Plate Assy. |
| 7 | K-361 | Knob, Tone & Volume |
| 8 | 800574 | Neon Plastic Cap |
| 9 | K-360 | Record Button |
| 10 | K-359 | Push Buttons |
| 11 | 800441 | Stop Button |
| 12 | 700477 | Hex Nut, 9/16-27 |
| 13 | 700890 | "E" Ring, .187 |
| 14 | 076191 | Rewind Idler Arm Assy. |
| 15 | 700797 | Washer, .191 x 7/16 Fiber |
| 16 | 076183 | Second Rewind Idler Wheel |
| 17 | 700890 | "E" Ring, .187 |
| 18 | 700797 | Washer, .191 x 7/16 Fiber |
| 19 | 076180 | Rewind Drive Idler Wheel |
| 20 | 076239 | Fast Forward Idler Wheel |
| 21 | 800478 | Brake Lining |
| 22 | 700890 | "E" Ring, .187 |
| 23 | 800563 | Brake Spring |
| 24 | 700890 | "E" Ring, .187 |
| 25 | 800563 | Brake Spring |
| 26 | 076190 | Brake Assy. |
| 27 | 700245 | Screw, Flat Hd. 4-40 x 1/4 |
| 28 | 800599 | Counter Mounting Clips |
| 29 | 076261 | Counter Assy. |
| 30 | 076189 | Mechanism Plate Assy. |
| 31 | 700890 | "E" Ring, .187 |
| 32 | 700806 | Washer, Nylon, .191 x .355 x .015 |
| 33* | 800714* | *Pressure Roller |
| 34 | 700807 | Nylon Washer, .257 x .437 x .015 |
| 35 | 076185 | Pressure-Roller Lever Assy. |
| 36 | 700797 | Fiber Washer, .191 x 7/16 |
| 37 | 700889 | "E" Ring, .250 |
| 38 | 700798 | Fiber Washer, .265 x 1/2 x .030 |
| 39 | 70607 | Record-Play Head |
| 40 | 70608 | Erase Head |
| 41 | 700345 | Hex Head Sheet-Metal Screw, #6 x 1/4 |
| 42 | IM-289 | Pressure Pad |
| 43 | 800476 | Pressure Roller Spring |
| 44 | 800564 | Pressure Pad |
| 45 | 800572 | Brake Actuating Spring |
| 46 | 800587 | Speed-Change Shaft Spring |
| 47 | 806612 | Torsion Spring |
| 48 | 700890 | "E" Ring, .187 |
| 49 | 700797 | Fiber Washer, .191 x 7/16 |
| 50 | 700797 | Fiber Washer, .191 x 7/16 |
| 51 | 700889 | "E" Ring, .250 |
| 52 | 700798 | Fiber Washer, .265 x 1/2 x .030 |
| 53 | 076194 | Head Mounting-Bracket Assy. |
| 54 | 701367 | Rubber Grommets |
| 55 | 802755 | Fixed Tape Guide |
| 56 | 800548 | Fast-Forward Idler Spring |
| 57 | 076260 | Forward Idler-Lever Assy. |
| 58 | 800576 | Retractor |
| 59 | 700894 | "E" Ring, .375 |
| 60 | 800477 | Rewind Idler Spring |
| 61 | 076184 | Rewind Lever Assy. |
| 62 | 076186 | Take-up Arm Assy. |
| 63 | 076288 | Push-button Assy. |
| 64 | 700348 | Hex Head Sheet-Metal Screws, #10 x 1/4 |
| 65 | 076201 | Pressure-Roller Link Assy. |
| 66 | 076202 | Rewind-Lever Link Assy. |
| 67 | 076200 | Forward-Lever Link Assy. |
| 68 | 700712 | Washer, .196 x 7/16 x .030 |
| 69 | 800547 | Fast-Forward Lever Spring |
| 70 | 700890 | "E" Ring, .187 |
| 71 | 800624 | Brake Lever |
| 72 | 076199 | Speed-Change Shaft Assy. |
| 73 | 700895 | "E" Ring, .312 |
| 74 | 076198 | Speed-Change Link Assy. |
| 75 | 700806 | Washer, .191 x .375 x .015 Nylon |
| 76 | 076180 | Speed-Change Idler Wheel Assy. |
| 77 | 700806 | Washer, .191 x .375 x .015 Nylon |
| 78 | 700890 | "E" Ring, .187 |
| 79 | 800587 | Speed-Change Spring |
| 80 | 076192 | Take-up Idler-Lever Assy. |
| 81 | 800545 | Take-up Idler Spring |
| 82 | 700797 | Washer, .191 x 7/16 x .015 Fiber |
| 83 | 076204 | Take-up Idler-Wheel Assy. |
| 84 | 700797 | Fiber Washer |
| 85 | 700890 | "E" Ring, .187 |
| 86 | 700896 | "E" Ring, .437 |
| 87 | 800461 | Take-up Spindle Shaft |
| 88 | 700797 | Fiber Washer, .191 x 7/16 x .015 |
| 89 | 076196 | Clutch Wheel Assy. |
| 90 | 800459 | Clutch Lining |
| 91 | 800458 | Clutch Plate |
| 92 | 800460 | Clutch Spring |
| 93 | 800655 | Fiber Washer, .484 x 3/4 x .010 |
| 94 | 800542 | Clutch Pulley |
| 95 | 700424 | Set Screw |
| 96* | *800544 | *Counter Belt |
| 97 | 076231 | Capstan & Flywheel Assy. |
| 98 | 800568 | Ball Bearing, .1875 Dia. |
| 99 | 700420 | Set Screw, 8-32 x 1/4 |
| 100 | 800520 | Forward & Rewind Pulley |
| 101 | 800462 | Drive Pulley |
| 102 | 800434 | Subplate |
| 103 | 700734 | Washer, #10 Ext. Tooth |
| 104 | 700230 | Hex Head Screw, #10-32 x 3/8 |
| 105 | 700420 | Set Screw, #8-32 x 1/4 |
| 106 | 701338 | Rubber Shock Mount |
| 107 | 800435 | Motor Mounting Plate |
| 108 | 701426 | Drive Motor |
| 109 | 700348 | Sheet-Metal Screw, #10 x 1/4 |
| 110 | 701338 | Rubber Shock Mounts |
| 111 | 701587 | Fan |
| 112 | 700420 | Set Screw |
| 113 | 800479 | Rewind Spindle Shaft |
| 114 | 700798 | Washer, .265 x 1/2 x .030 Fiber |
| 115 | 700889 | "E" Ring, .250 |

* Pressure Roller, Walsco Part No. 1488
* Counter Drive Belt, Walsco Part No. 1410-54




AMP CHASSIS TOP VIEW

# AMP PARTS LIST AND DESCRIPTIONS

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Preamplifier | 12AX7/ECC83 |
| V2 | AF Amplifier | 12AT7 |
| V3 | Output | 6CM6 |
| V4 | Bias Oscillator | 6S4 |
| V5 | Rectifier | 6X4 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA TRAV-LER PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲30 | 450 | 701800 | | C1070 ǂ | FP376.9 ♦ | | TVL-2714 | |
| B | ■50 | 350 | | | | | | TVA-1713 | |
| C | 40 | 25 | | | | | | | |
| C2A | ▲40 | 300 | 701681 | | D0460 ǂ | | | PCLS-4560.7* | |
| B | ■40 | 300 | | | | | | | |
| C | ▲50 | 25 | | | | | | | |
| D | 50 | 25 | | | | | | | |

ǂ Use printed circuit adaptors #55277 and 55278
♦ Use adaptor kit FPA
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C3 | 20 NPO 10% | | NPO-DI20 | DTZ-20 | C10Q2C | CCTO-200 | CNO-422 | 10TCC-Q20 |
| C4 | 90 N750 10% | | N750-DI100 | DTN-100 | C10T1U | CCTN-101 | CN7-310 | 10TCU-T10 |
| C5 | .1 200V | #701808 | | | | | | |
| C6 | 3900 10% | | DI-3900 | | | CCD-392 | JL-239 | 10TS-D39 |
| C7 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C8 | 1200 10% | | DI-1200 | DD-122 | | CCD-121 | GP212 | 10TS-D12 |
| C9 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C10 | 4700 | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | GP247 | 5HK-D47 |
| C11 | 1200 10% | | DI-1200 | DD-122 | | CCD-122 | GP212 | 10TS-D12 |
| C12 | .047 400V | | P4151N-047 | DD-503 | BC6S47J | 4PP-3-473 | ACE6147 | 4SE-S47 |
| C13 | .047 400V | | P4151N-047 | DD-503 | BC6S47J | 4DP-3-473 * | ACE6147 | 4SE-S47 |
| C14 | 270 N2200 10% | #701789 | | | | | | |
| C15 | 50 N33 10% | #701788 | | | | | | |
| C16 | 150 10% | | DI-150 | DD-151 | L10T15 | CCD-151 | GP315 | 10TS-T15 |
| C17 | .022 400V | | P4151N-022 | DD-203 | BC6S22J | 4DP-2-233 | ACE6122 | 4SE-S22 |
| C18 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C19 | 10000 10% | | DI-10000 | | | CCD-103 * | | 10TS-S10 |
| C20 | 200 N150 10% | #701802 | | | | | | |
| C21 | 1500 10% | | 1469-0015 | | 1R5D15 | CM-20B152K | MCB456 | MS215 |
| C22 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C23 | 1200 10% | | DI-1200 | DD-122 | | CCD-122 | GP212 | 10TS-D12 |

# Trav-ler Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA TRAV-LER PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K | ½ | 702008 ① | | | | | Volume |
| B | Switch | | | | | | | Power Off-On |
| R2 | 5000Ω | ½ | 702007 | | | | | Tone |
| R3 | 200Ω | 2 (ww) | 701849 | | | | | Hum balance |

① Some versions may use 800749 in this application

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 22K | |
| R5 | 1meg | |
| R6 | 2.7meg | |
| R7 | 150K | |
| R8 | 470K | |
| R9 | 220K | |
| R10 | 150K | |
| R11 | 22K | |
| R12 | 100K | |
| R13 | 1500Ω | |
| R14 | 47K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R15 | 220K | |
| R16 | 15K | |
| R17 | 100K | |
| R18 | 1500Ω | |
| R19 | 10K | |
| R20 | 27K | |
| R21 | 100K | |
| R22 | 22K | |
| R23 | 2.2meg | |
| R24 | 47K | |
| R25 | 470K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R26 | 270Ω 1W | |
| R27 | 47K | |
| R28 | 100K | |
| R29 | 15Ω 1W | |
| R30 | 22K | |
| R31 | 1800Ω | |
| R32 | 33K | |
| R33 | 220K | |
| R34 | 1000Ω 5W | |
| R35 | 1500Ω | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA TRAV-LER PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | Bias Osc Coil | 800556 | | | | | | |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ① .7A | 600VCT ② .050A | 6.3V ③ 2.2A | 800453G | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 4500Ω | 6-8Ω | 800566F | | | | | | | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA TRAV-LER PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 4" | PM | 3-4Ω | SPK-38 | 4A1 | |
| SP2 | 4" | PM | 3-4Ω | SPK-38 | 4A1 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | TRAV-LER PART No. | NOTES |
|---|---|---|---|
| M1 | Head | | Erase |
| M2 | Head | | Record, play back |
| M3 | Switch | | Record - playback, slide Type |
| M4 | Motor | 20400 | Drive |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

| | |
|---|---|
| TRADE NAME | Truetone Models DC3085A, DC3085B |
| SUPPLIER | Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo. |
| TYPE SET | Battery Operated Transistorized Portable AM Receiver |
| POWER SUPPLY | 9 Volts DC |
| TUNING RANGE—BROADCAST | 540 — 1650KC RATING 21MA@9 Volts DC |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3.... GENERAL CEMENT #5097, 8727
WALSCO #2515
A4, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A5..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .01mfd to base of Converter. Low side to chassis. | 455KC (400~ Mod.) | Tuning gang fully open. | Across voice coil. | A1, A2, A3 | Adjust for maximum output. |
| 2. | Loop | 1650KC | " | " | A4 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | " | 540KC | Tuning gang fully closed. | " | A5 | " |
| 4. | " | 1400KC | Tune to 1400KC signal. | " | A6 | " |
| 5. | " | 600KC | Tune to 600KC signal. | " | | Retouch A5 for maximum output while rocking tuning gang. |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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JF810

DATE 7—60 SET 492 FOLDER 25

TRUETONE MODELS
DC3085A, B

SET 492 FOLDER 25

# PARTS LIST AND DESCRIPTIONS

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2N485 | Converter | | 2N412 | 2N485 | 2N374 | PNP |
| X2 | CK879 | Overload & AVC | | 2N410 | CK879 | 2N406 | PNP |
| X3 | 2N483 | IF Amp. | | 2N410 | 2N483 | 2N139 | PNP |
| X4 | CK879 | Detector | | 2N410 | CK879 | 2N406 | PNP |
| X5 | 2N482 | IF Amp. -AF Amp. Detector | | 2N406 | 2N482 | 2N410 | PNP |
| X6 | 2N631 * | Output | | 2N408 | 2N631 | 2N408 | PNP |

* Type 2N632 may be used in this application.

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | TRUETONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 25 | 10 | 150-133 | BCD10025 | EC25-10 | TT10X25 | ML30-15 | TE-1118 | |
| C2 | 50 | 10 | 150-134 | XPP10050 | EC50-10 | TT10X50 | ML50-15 | TE-1119 | |
| C3 | 12 | 10 | 150-132 | XPP10010 | EC10-10 | TC43 | ML10-15 | TE-1114 | |
| C4 | 25 | 10 | 150-133 | XPP10025 | EC25-10 | TT10X25 | ML30-15 | TE-1118 | |
| C5 | 80 | 10 | | BCD10080 | EC100-10 | TT15X100 | ML100-15 | TE-1119, 3 | ① |
| C6 | 80 | 10 | | PWE10100 | EC100-10 | TT15X100 | ML100-15 | TE-1119, 3 | ① |

① Some versions may use 100mfd Part #150-148.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C7 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C8 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C9 | 50000 | | BPD-05 | DD-503 | H-05S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C10 | 4.7 NPO 5% | | NPO-DI 4.7 | DTZ-4R7 | DTZ-4R7 | C10V47C | CCTO-547 | 10TCC-V47 |
| C11 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C12 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C13 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C14 | 3.5 NPO ± .25mmf | | NPO-DI 3.3 | DTZ-3R3 | C10V33C | CCTO-3R3 | CNO-533 | 10TCC-V33 |
| C15 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C16 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C17 | 50000 | | BPD-05 | DD-503 | H-05S5 | 1DP-2-503 | GP150 | 5HK-S50 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | TRUETONE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 5000Ω | ½ | 120-163 | B-11 | A47-5000-S | Q13-114 | U12 | Volume |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-4 | SWE-13 | 76-1 | US-26 | Power Off-On |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

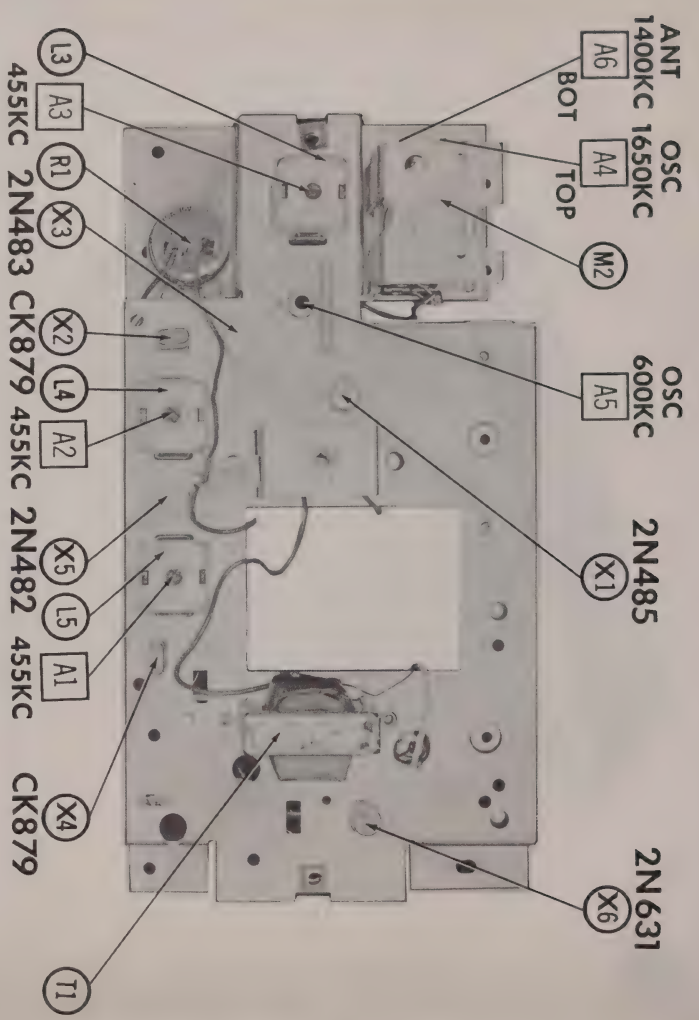
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 2200Ω | |
| R3 | 33K 1W | |
| R4 | 1000Ω | |
| R5 | 1000Ω | |
| R6 | 180K | (220K) * |
| R7 | 220Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R8 | 1500Ω | |
| R9 | 12K | |
| R10 | 10K | |
| R11 | 1500Ω | |
| R12 | 220Ω | (470Ω)* |
| R13 | 2200Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R14 | 470Ω | |
| R15 | 10K | |
| R16 | 1500Ω | |
| R17 | 68Ω | |

* Alternate Value.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | TRUETONE PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | 132-145C ① | | | | | | |
| L2 | Osc. Coil | 136-146B ② | | | | | | |
| L3 | 1st IF Trans. | 130-139 | | | | | | |
| L4 | 2nd IF Trans. | 130-140 | | | | | | |
| L5 | 3rd IF Trans. | 130-141 | | | | | | |

① Part #132-145 used in Model DC3085A.
② Part #136-146 used in Model DC3085A.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | TRUETONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 460Ω | 3-4Ω | 138-144 | | | | | | | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | TRUETONE PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | | 4A07 | |

## BATTERIES

| ITEM No. | VOLTAGE | TRUETONE PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M1 | 1.5V | 3B6731* | | 1 * | | 635 * | | M-14R * | * 6 Required |

## MISCELLANEOUS

| ITEM No. | PART NAME | TRUETONE PART No. | NOTES |
|---|---|---|---|
| M2 | Tuning Cap. | 160-135B | 2 Gang, Model DC3085B(Ant. 24-272mmf, Osc. 23-125mmf) |
| | Tuning Cap. | 160-135 | 2 Gang, Model DC3085A |

## CABINETS & CABINET PARTS

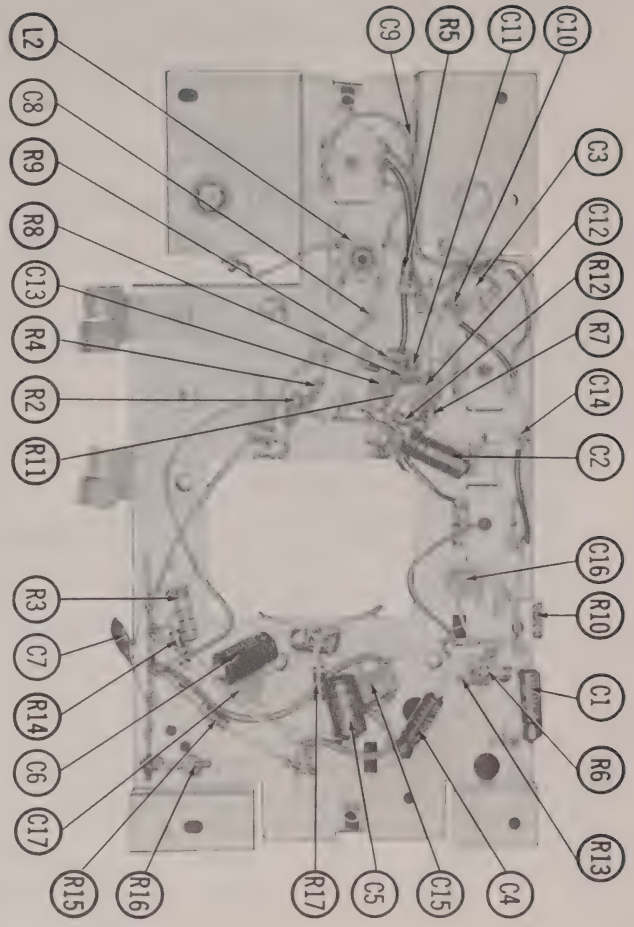
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

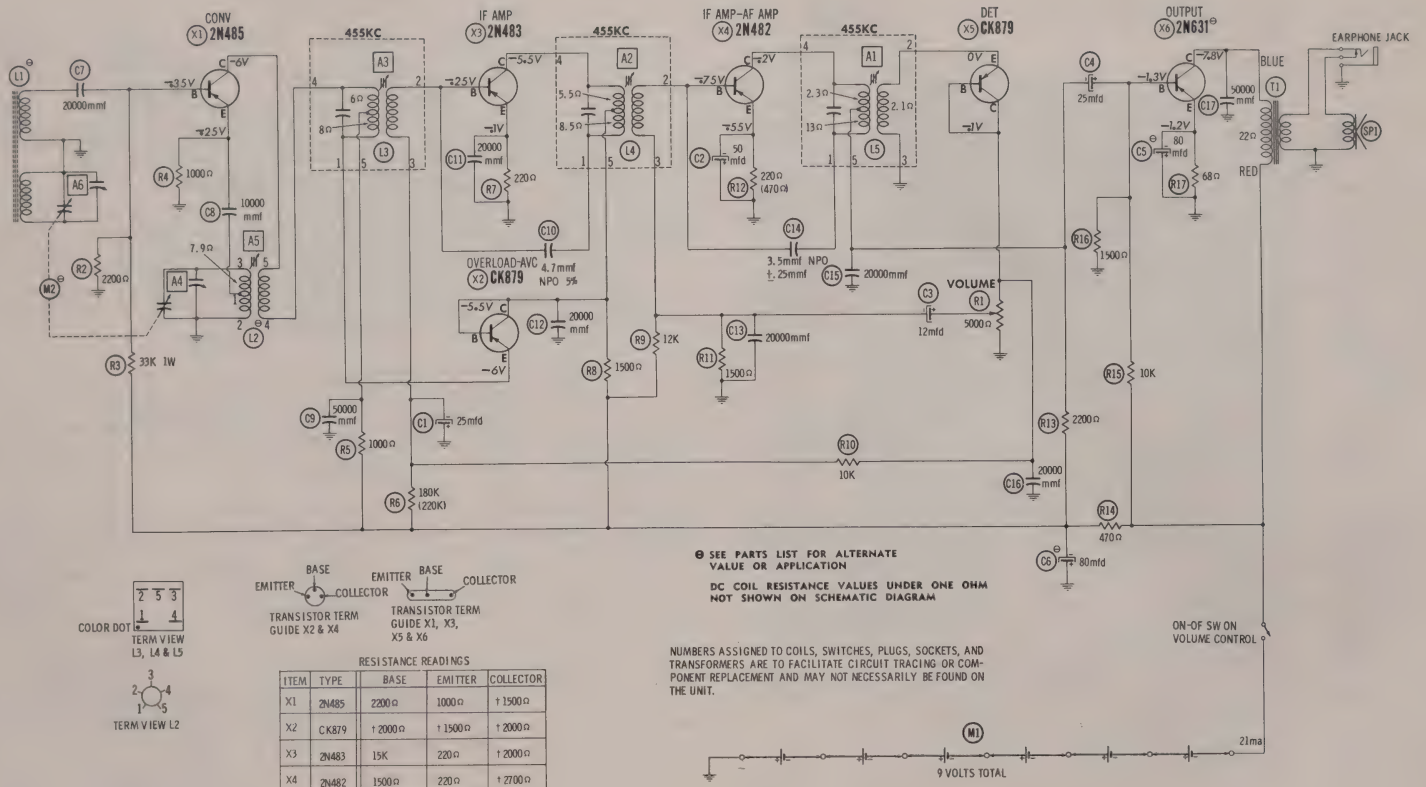
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 220-177C | Tuning Drive, Model DC3085B |
| Knob | 220-177 | Tuning Drive, Model DC3085A |
| Knob | 220-174 | Calibration Disc. |
| Handle | 240-134 | |
| Cabinet | 210-167E | |

## WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

## CHASSIS—BOTTOM VIEW















RESISTANCE READINGS

| ITEM | TYPE | BASE | EMITTER | COLLECTOR |
|---|---|---|---|---|
| X1 | 2N485 | 2200Ω | 1000Ω | †1500Ω |
| X2 | CK879 | †2000Ω | †1500Ω | †2000Ω |
| X3 | 2N483 | 15K | 220Ω | †2000Ω |
| X4 | 2N482 | 1500Ω | 220Ω | †2700Ω |
| X5 | CK879 | 5000Ω | 2.1Ω | 5000Ω |
| X6 | 2N63 | 1500Ω | 68Ω | †22Ω |

† MEASURED FROM JUNCTION OF R14 AND R15.

❸ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.




ON-OF SW ON VOLUME CONTROL

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**TRUETONE MODELS DC3085A, B**

PHOTOFACT® Folder

# WESTINGHOUSE MODELS H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1)

WESTINGHOUSE MODELS H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1)

MODEL H-60ACS1

WESTINGHOUSE MODELS H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1)

| | |
|---|---|
| TRADE NAME | Westinghouse Models H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1) |
| MANUFACTURER | Westinghouse Electric Corp., Metuchen, N. J. |
| TYPE SET | AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 105-120 Volts AC, 60 Cycles RATING 39 Watts, .4 Amp. @117 Volts AC |

FOR SERVICE INFORMATION ON RECORD CHANGER PART #670V009H01 — SEE COLLARO CONQUEST — PHOTOFACT SET 390 FOLDER 5

SET 492 FOLDER 26

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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JT771

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Left Channel AF Amp. - Right Channel AF Amp. | 12AX7 (7025) | V2<br>V3 | Left Channel Output<br>Right Channel Output | 6CU5<br>6CU5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Westinghouse PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | ▪80 | 160 | 218V044H01 | AFH4-108-40 | D0350 | FP422.7 | TMQ-40 | TVL-4635.7 | |
| B | 20 | 150 | | | | | | | |
| C | ▪80 | 150 | | | | | | | |
| D | ▲40 | 150 | | | | | | | |
| C2 | 10 | 25 | 218V025H33 | PRS1250 | BBR10-25 | TC22 | TD-10-25 | TVA-1204 | |
| C3 | 50 | 25 | 218V025H32 | PRS1265 | BBR50-25 | TC29 | TD-50-25 | TVA-1206 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C4 | .033 600V | | P688N-033 | DD-303 | CUB6S33 | 6DP-3-333 | GEM-6133 | 6TM-S33 |
| C5 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C6 | 470 | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | GP347 | 10TS-T47 |
| C7 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C8 | 3300 | | BPD-0033 | DD-332 | BYA10D33 | CCD-332 | GP233 | 5HK-D33 |
| C9 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C10 | 470 | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | GP347 | 10TS-T47 |
| C11 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C12 | 3300 | | BPD-0033 | DD-332 | BYA10D33 | CCD-332 | GP233 | 5HK-D33 |
| C13 | .01 600V | | P688N-01 | D6-103 | CUB6S1 | 6DP-2-103 | GEM-611 | 6TM-S1 |
| C14 | .047 600V | | P688N-047 | DD-503 | CUB6S47 | 6DP-3-473 | GEM-6147 | 6TM-S47 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Westinghouse PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 2meg | ½ | 270V072H03 | B-76 | AD47-2meg-Z | | ▪ UE1877 | Loudness, Left Channel |
| B | 2meg | ½ | | SR-76 | Not Req. | | | Loudness, Right Channel |
| C | Shaft | | | Not Req. | FS-3 | | | |
| R2A | 3meg | ½ | 270V072H02 | B-84 | | | ▪ | Treble, Left Channel |
| B | 3meg | ½ | | SR-84 | | | | Treble, Right Channel |
| R3A | 1meg | ½ | 270V072H01 | B-69 | AD47-1meg-S | | ▲ UE1706 | Bass, Left Channel |
| B | 1meg | ½ | | SR-69 | Not Req. | | | Bass, Right Channel |
| C | Shaft | | | Not Req. | FS-3 | | | |
| R4A | 500K | ½ | 270V072H04 | | C47S-500K-S | | PP55L | Balance |
| B | Switch | | | | Not Req. | | Not Req. | Push-Pull Monaural-Stereo |

▪ "STA-LOC" equivalent: FA26A, RU26A, CS3500.
▲ "STA-LOC" equivalent: FA36L, RU36L, CS3500.
▲ "STA-LOC" equivalent: FB16L, RU16L, CS3500.

## RESISTORS

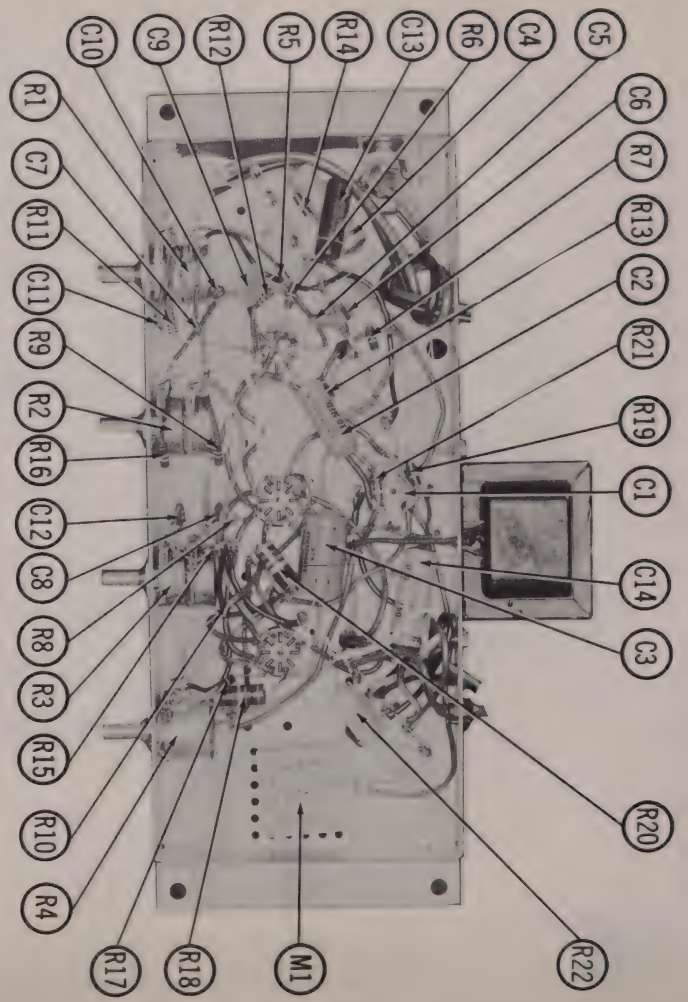
All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 33K | |
| R6 | 220K | |
| R7 | 120K | |
| R8 | 82K | |
| R9 | 100K | |
| R10 | 10K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R11 | 33K | |
| R12 | 220K | |
| R13 | 2700Ω | |
| R14 | 120K | |
| R15 | 82K | |
| R16 | 100K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R17 | 10K | |
| R18 | 100Ω 2W | |
| R19 | 10K | |
| R20 | 150Ω 2W | |
| R21 | 150Ω | |
| R22 | 18Ω 2W | |

# CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | Westinghouse PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V Ⓐ .3A | 6.3V Ⓐ 2.7A | | 430V079H01 | | | | P-6466 ① | | |

① Tape Center Tap.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | Westinghouse PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 1500Ω | 3-4Ω | 430V081H01 | | | | | | | |
| T3 | 3800Ω CT | 6-8Ω CT | 430V080H01 | | | | | | | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | Westinghouse PART No. | QUAM PART No. | |
| SP1 | 6" | PM | 6-8Ω | 570V068H01 | 52A21Z6.4 | |
| SP2 | 6" | PM | 6-8Ω | 570V068H01 | 52A21Z6.4 | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | Westinghouse PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M1 | .085A | 295V015H02 ① | RS150 ① | 1235AH ① | 150Z ① | SR200 ② | ① Selenium Type ② Silicon Type |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Westinghouse PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M2 | 671V001H02 | 13T | Not Req. | 13 | Not Req. | | | 8TA4-S | N-8TA-S |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

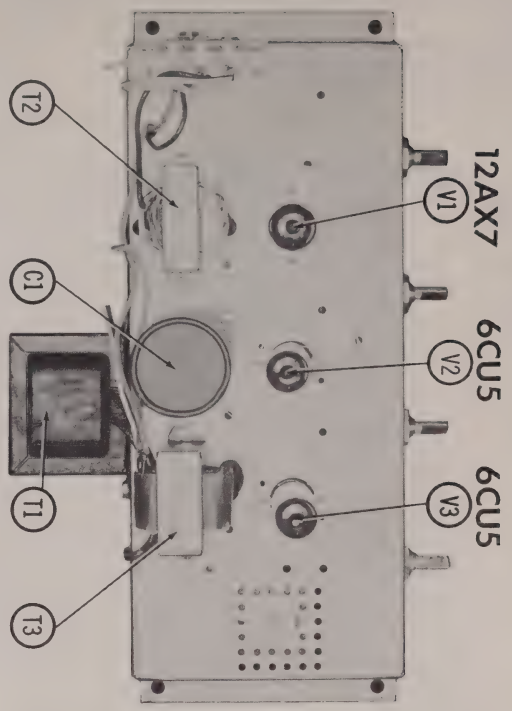
| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | Westinghouse PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M3 | | * W-204DS †♦ or * W-204DD-1♦ | * A-44X † or * A-44XSD †♦ or * A-44XDD ♦ | † Jewel ♦ Diamond * Includes Cartridge |

## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 550V118H01 | Loudness, Bass, Treble, & Balance |
| Cabinet | 516V111H01 | Model H-60ACS1 |
| Cabinet | 516V111H02 | Model H-60ACS2 |
| Cabinet | 516V111H03 | Model H-60ACS3 |
| Cabinet | 516V089H01 | Model H-F1000 |
| Cabinet | 516V089H02 | Model H-F1001 |
| Cabinet | 516V089H03 | Model H-F1002 |
| Cabinet | 516V089H04 | Model H-F1003 |
| Cabinet Lid | 690V012H94 | Model H-60ACS1 |
| Cabinet Lid | 690V012H95 | Model H-60ACS2 |
| Cabinet Lid | 690V012H96 | Model H-60ACS3 |
| Cabinet Lid | 690V012H87 | Model H-F1000 |
| Cabinet Lid | 690V012H88 | Model H-F1001 |
| Cabinet Lid | 690V012H89 | Model H-F1002 |
| Cabinet Lid | 690V012H90 | Model H-F1003 |
| Cabinet Leg | 518V001H18 | Model H-60ACS2 |

# CHASSIS—TOP VIEW




## CABINETS & CABINET PARTS (cont)

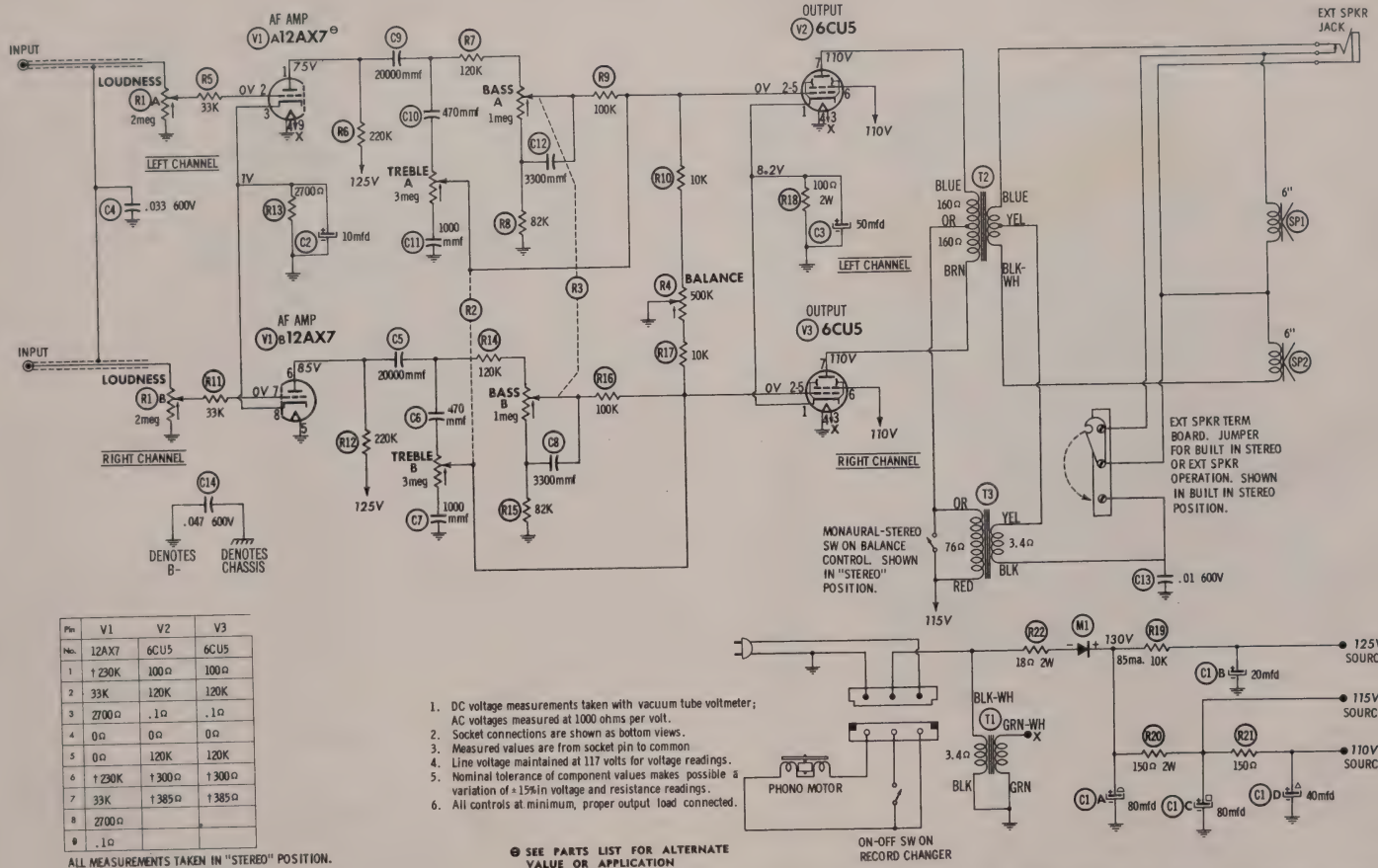
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Cabinet Leg | 518V001H17 | Model H-60ACS3 |
| Cabinet Leg | 518V001H20 | Model H-60ACS1 |
| Cabinet Leg | 518V001H29 | Model H-F1000 |
| Cabinet Leg | 518V001H27 | Model H-F1001 |
| Cabinet Leg | 518V001H28 | Model H-F1002 |
| Cabinet Leg | 518V001H30 | Model H-F1003 |

## WIRING DATA

| | | |
|---|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. | 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. | 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. | 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. | 8430 (Two Conductor - Twisted) |

WESTINGHOUSE MODELS H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1)

FOLDER 26




| Pin No. | V1 12AX7 | V2 6CU5 | V3 6CU5 |
|---|---|---|---|
| 1 | †230K | 100Ω | 100Ω |
| 2 | 33K | 120K | 120K |
| 3 | 2700Ω | .1Ω | .1Ω |
| 4 | 0Ω | 0Ω | 0Ω |
| 5 | 0Ω | 120K | 120K |
| 6 | †230K | †300Ω | †300Ω |
| 7 | 33K | †385Ω | †385Ω |
| 8 | 2700Ω | | |
| 9 | .1Ω | | |

ALL MEASUREMENTS TAKEN IN "STEREO" POSITION.
† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

**WESTINGHOUSE MODELS H-F1000, H-F1001, H-F1002, H-F1003, H-60ACS1, H-60ACS2, H-60ACS3 (Ch. V-2507-1)**

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT® Folder with CIRCUITRACE®

# ZENITH MODEL Royal 675L (Ch. 6CT41Z1)

ZENITH MODEL Royal 675L (Ch. 6CT41Z1)

ZENITH MODEL Royal 675L (Ch. 6CT41Z1)

| | |
|---|---|
| TRADE NAME | Zenith Model Royal 675L (Ch. 6CT41Z1) |
| MANUFACTURER | Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois |
| TYPE SET | Battery Operated Transistorized Portable AM Receiver |
| POWER SUPPLY | 6 Volts DC |
| TUNING RANGE-BROADCAST | 535-1620 KC RATING 7 MA @ 6 Volts DC (No Signal, Minimum Volume)<br>25 MA @ 6 Volts DC (Signal, Normal Volume) |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1 | Loop | 455 KC (400% mod.) | 600 KC | Across voice coil. | A1, A2 A3 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output |
| 2 | " | 1620 KC | Tuning gang fully open | " | A4 | " |
| 3 | " | 535 KC | Tuning gang fully closed. | " | A5 | Adjust for maximum output. Repeat steps 2 and 3. |
| 4 | " | 1260 KC | Tune to 1260 KC signal | " | A6 | Adjust for maximum output |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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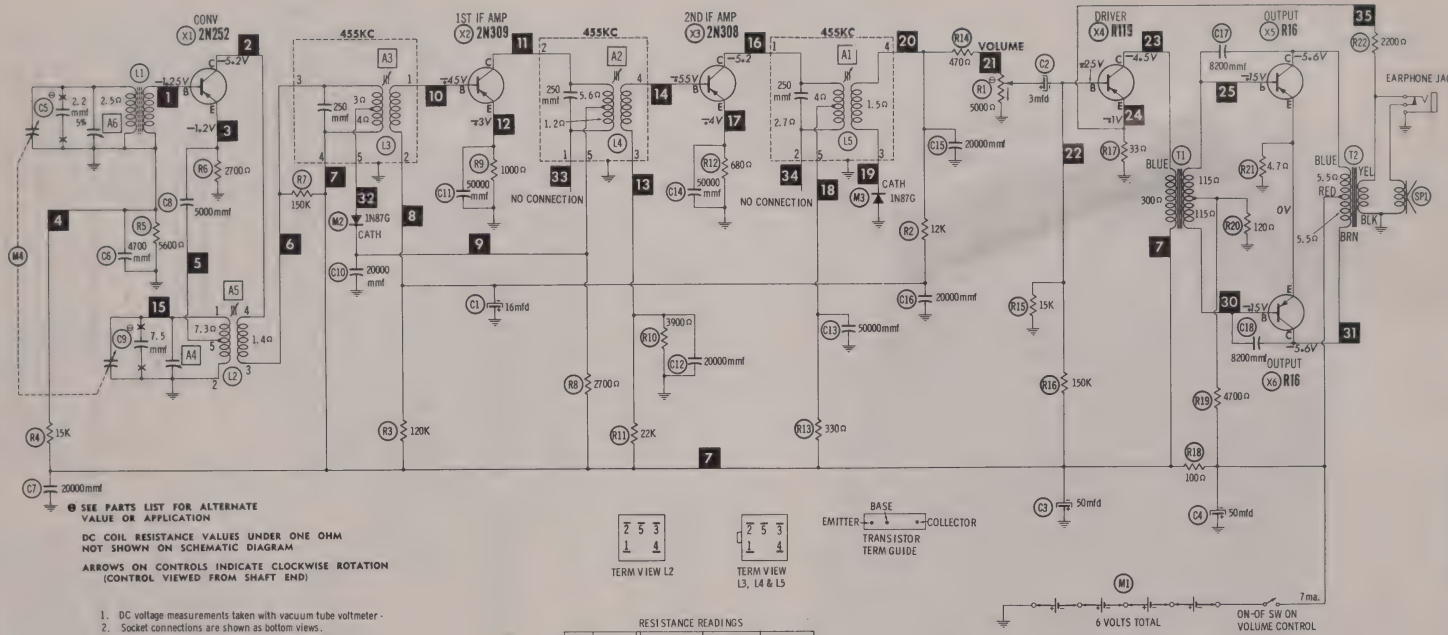
JF752



SET 492 FOLDER 27




● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TYPE | BASE | EMITTER | COLLECTOR |
|---|---|---|---|---|
| X1 | 2N252 | 4800Ω | 2700Ω | †100Ω |
| X2 | 2N309 | 15K | 1000Ω | †100Ω |
| X3 | 2N308 | 3900Ω | 680Ω | †430Ω |
| X4 | S119 | 15K | 33Ω | †400Ω |
| X5 | R16 | 235Ω | 4.7Ω | †5.5Ω |
| X6 | R16 | 235Ω | 4.7Ω | †5.5Ω |

† MEASURED FROM JUNCTION OF R18 AND R19 TRASNISTORS REMOVED FOR RESISTANCE MEASUREMENTS.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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**ZENITH MODEL Royal 675L (Ch. 6CT41Z1)**

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2N252 | Converter | | | 2N486 | | PNP |
| X2 | 2N309 | 1st IF Amplifier | | | 2N483 | | PNP |
| X3 | 2N308 | 2nd IF Amplifier | | | 2N483 | | PNP |
| X4 | R119 | Driver | | 2N406 | 2N362 | | PNP |
| X5 | R16 | Output | | 2N408 | 2N632 | | PNP } Matched Pair |
| X6 | R16 | Output | | 2N408 | 2N632 | | PNP } Matched Pair |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | ZENITH PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 16 | 3 | 22-2871 | PWE3015 | EC15-6 | TT6X15 | ML20-6 | TE-1053. 5 | |
| C2 | 3 | 12 | 22-2884 | PWE25003 | EC5-15 | TT12X3 | ML10-6 | TE-1122 | |
| C3 | 50 | 6 | 22-2726 | PWE6050 | EC50-6 | TT6X50 | ML50-6 | TE-1100 | |
| C4 | 50 | 6 | 22-2726 | PWE6050 | EC50-6 | TT6X50 | ML50-6 | TE-1100 | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C5 | 2.2 5% | Note 1 | NPO-SI2. 2 | TCZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C6 | 4700 | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | GP247 | 5HK-D47 |
| C7 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C8 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C9 | 7. 5 | Note 1 | | | C10V8C | | | |
| C10 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C11 | 50000 | | BPD-05 | DD-503 | H-05S5 | | GP150 | 5HK-S50 |
| C12 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C13 | 50000 | | BPD-05 | DD-503 | H-05S5 | | GP150 | 5HK-S50 |
| C14 | 50000 | | BPD-05 | DD-503 | H-05S5 | | GP150 | 5HK-S50 |
| C15 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C16 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C17 | 8200 | | DAC-26 | DD-822 | HVE16D8 | CCD-822 | VAC-280 | BL-D80 |
| C18 | 8200 | | DAC-26 | DD-822 | HVE16D8 | CCD-822 | VAC-280 | BL-D80 |

Note 1. Not Used In Some Versions

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ZENITH PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1 | 5000Ω | ½ | 63-4035 ① | | | | | Volume and Switch |

① Some Versions May Use Part #63-4094

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

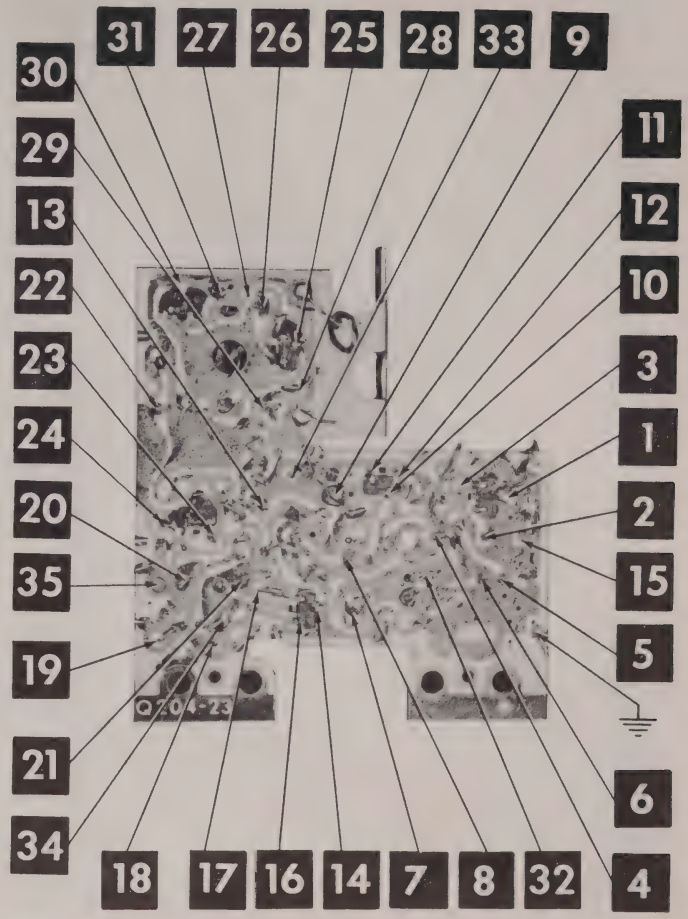
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 12K | |
| R3 | 120K | |
| R4 | 15K | |
| R5 | 5600Ω | |
| R6 | 2700Ω | |
| R7 | 150K | |
| R8 | 2700Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 1000Ω | |
| R10 | 3900Ω | |
| R11 | 22K | |
| R12 | 680Ω | |
| R13 | 330Ω | |
| R14 | 470Ω | |
| R15 | 15K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R16 | 150K | |
| R17 | 33Ω | |
| R18 | 100Ω | |
| R19 | 4700Ω | |
| R20 | 120Ω | |
| R21 | 4. 7Ω | |
| R22 | 2200Ω | |

# PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | ZENITH PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | S-47355 | | | | | | |
| L2 | Osc Coil | 95-1686 | | | | | | |
| L3 | 1st IF Trans | 95-1687 | | | | | | |
| L4 | 2nd IF Trans | 95-1601 | 16-9003 | 16-9003 | | | | |
| L5 | 3rd IF Trans | 95-1602 | 16-9004 | 16-9004 | | | | |

## TRANSFORMER (DRIVER)

| ITEM No. | TURNS RATIO | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ZENITH PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 1 | 1 | 95-1518 | TR-2 ① | | TA-30 ① | TR-2 ① | T-33X① | ① Remove Frame |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ZENITH PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 350Ω CT | 3-4Ω | 95-1685 | | | | | | TY-57X① | ① Bend Tabs Down |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | ZENITH PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 49-839 | 4A07 | |

## BATTERIES

| ITEM No. | VOLTAGE | ZENITH PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M1 | 1.5V | Z7 * | | 1 * | | 635 * | | M-14R * | *4 Required |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | ZENITH PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M2 | 1N87G | 103-19 | 1N60 | 1N60 | 1N60 | Overload (Pigtail) |
| M3 | 1N87G | 103-19 | 1N60 | 1N60 | 1N60 | Detector (Pigtail) |

## MISCELLANEOUS

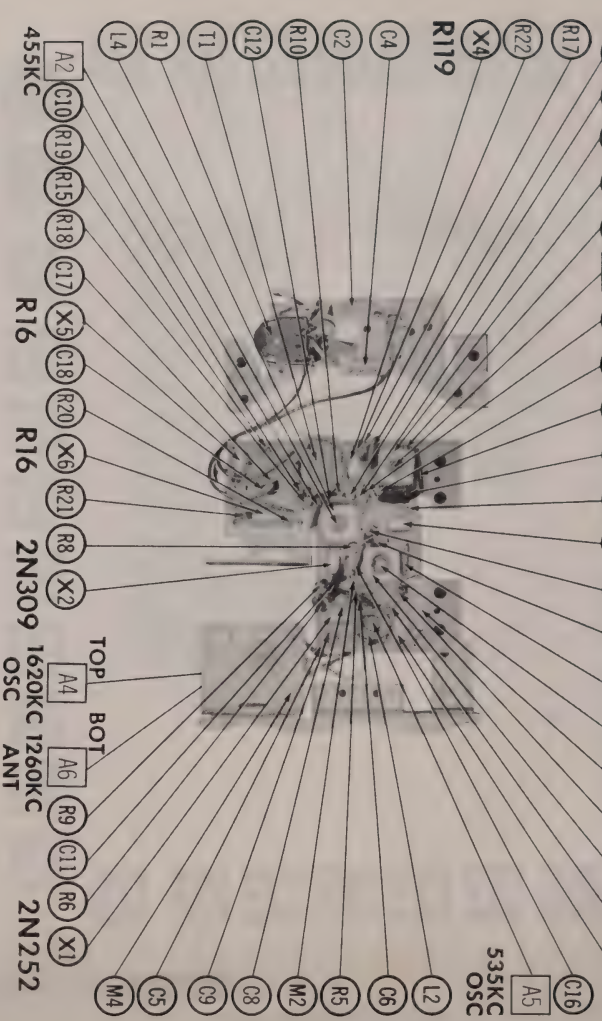
| ITEM No. | PART NAME | ZENITH PART No. | NOTES |
|---|---|---|---|
| M4 | Tuning Cap | 22-3183 | 2 Gang |

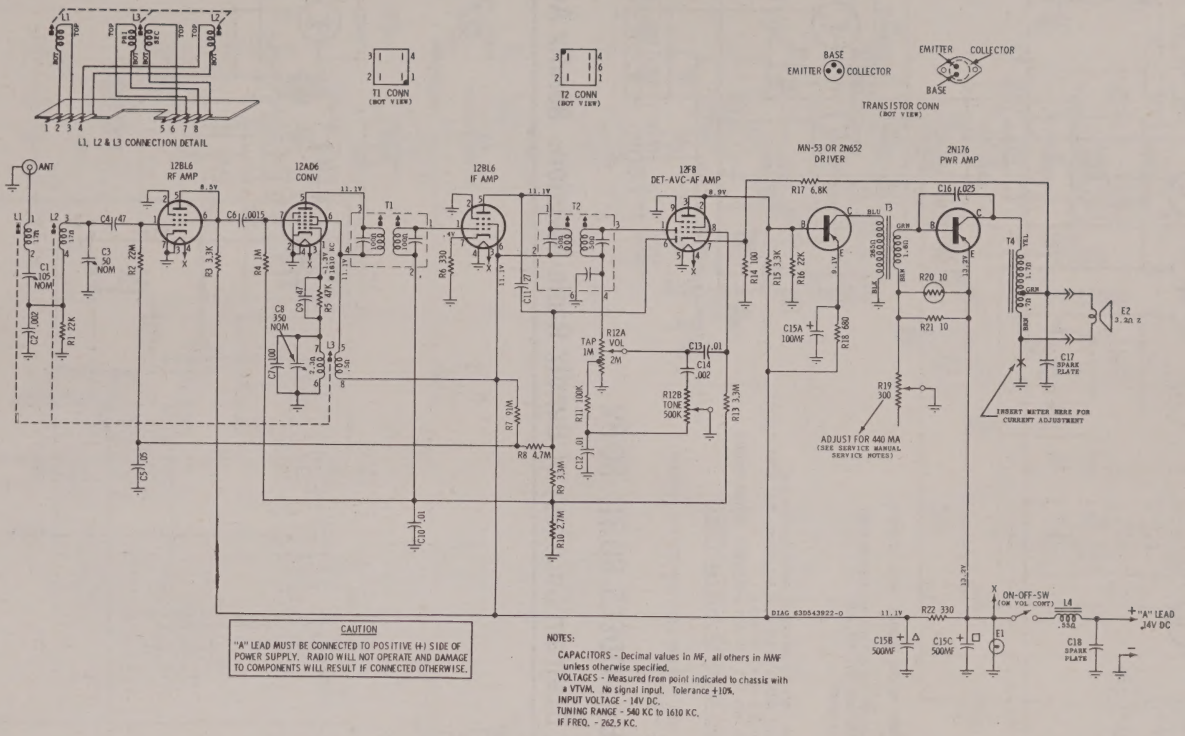
## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 46-2155 | Tuning |
| Knob | 46-1670 | Dial |
| Knob | 46-2154 | Volume |
| Cabinet | 14-2811 | |

## CHASSIS—TOP VIEW




L1 L2 L3 CONNECTION DETAIL
T1 CONN (BOT VIEW)
T2 CONN (BOT VIEW)
TRANSISTOR CONN (BOT VIEW)
BASE
EMITTER
COLLECTOR
ANT
12BL6 RF AMP
12AD6 CONV
12BL6 IF AMP
12F8 DET-AVC-AF AMP
MN-53 OR 2N652 DRIVER
2N176 PWR AMP
ADJUST FOR 440 MA (SEE SERVICE MANUAL SERVICE NOTES)
INSERT METER HERE FOR CURRENT ADJUSTMENT
ON-OFF-SW (GANG VOL CONT)
"A" LEAD 14V DC
DIAG 030543922-O
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance ±10%.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.

# MOTOROLA MODEL CRM60X

Schematic Diagram Courtesy of Motorola Inc.

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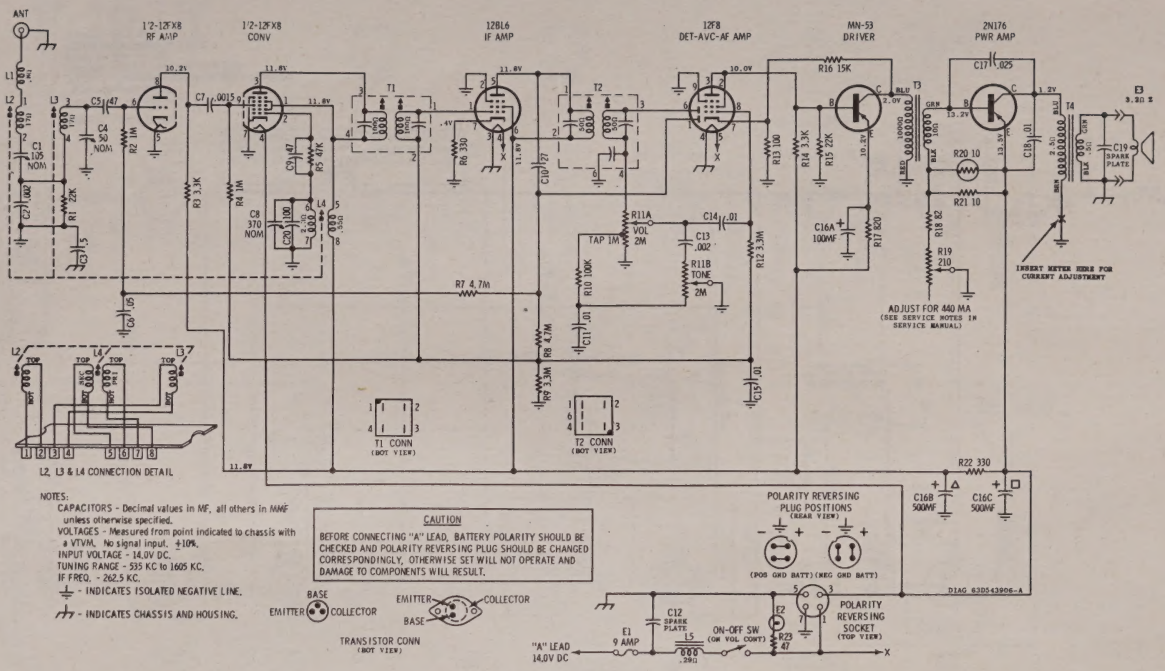
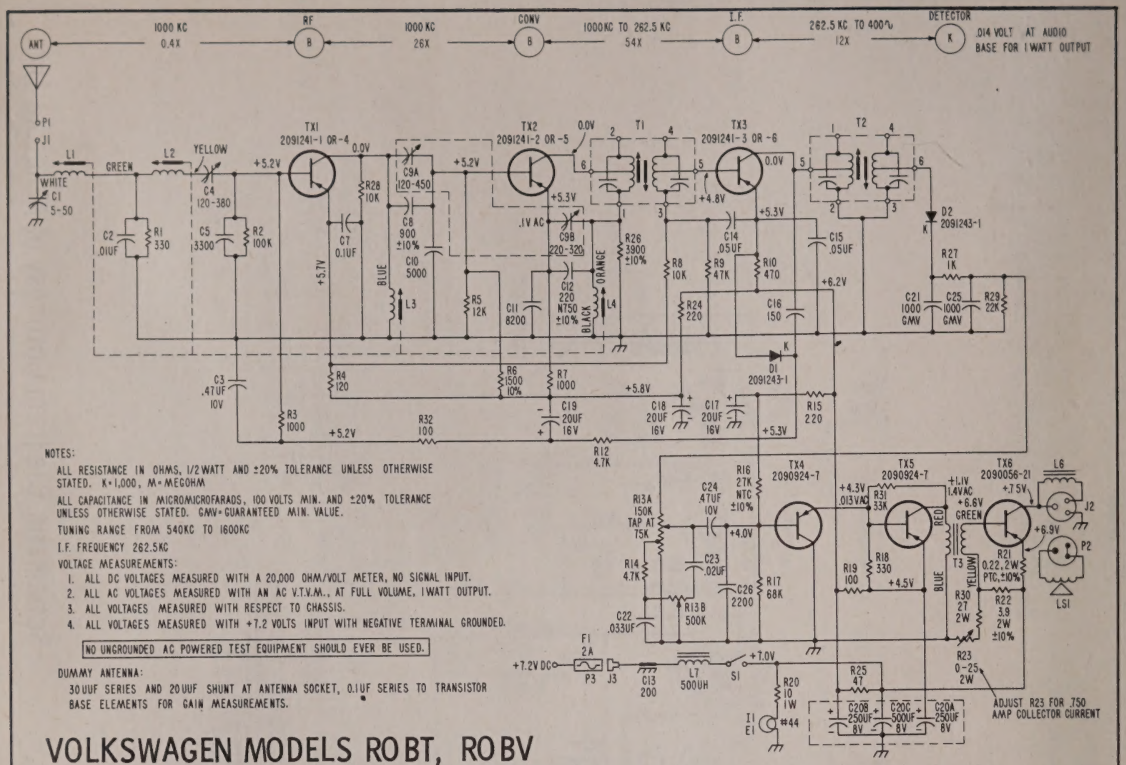

ANT
1'2-12FX8 RF AMP
1'2-12FX8 CONV
12BL6 IF AMP
12F8 DET-AVC-AF AMP
MN-53 DRIVER
2N176 PWR AMP
T1 CONN (BOT VIEW)
T2 CONN (BOT VIEW)
L2, L3 & L4 CONNECTION DETAIL
ADJUST FOR 440 MA (SEE SERVICE NOTES IN SERVICE MANUAL)
INSERT METER HERE FOR CURRENT ADJUSTMENT
POLARITY REVERSING PLUG POSITIONS (REAR VIEW)
(POS GND BATT) (NEG GND BATT)
DIAG 63D543906-A
TRANSISTOR CONN (BOT VIEW)
POLARITY REVERSING SOCKET (TOP VIEW)
"A" LEAD 14.0V DC
ON-OFF SW (ON VOL CONT)
E1 9 AMP
NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. ±10%.
INPUT VOLTAGE - 14.0V DC.
TUNING RANGE - 535 KC to 1605 KC.
IF FREQ. - 262.5 KC.
⏚ - INDICATES ISOLATED NEGATIVE LINE.
⏚ - INDICATES CHASSIS AND HOUSING.
CAUTION
BEFORE CONNECTING "A" LEAD, BATTERY POLARITY SHOULD BE CHECKED AND POLARITY REVERSING PLUG SHOULD BE CHANGED CORRESPONDINGLY, OTHERWISE SET WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT.

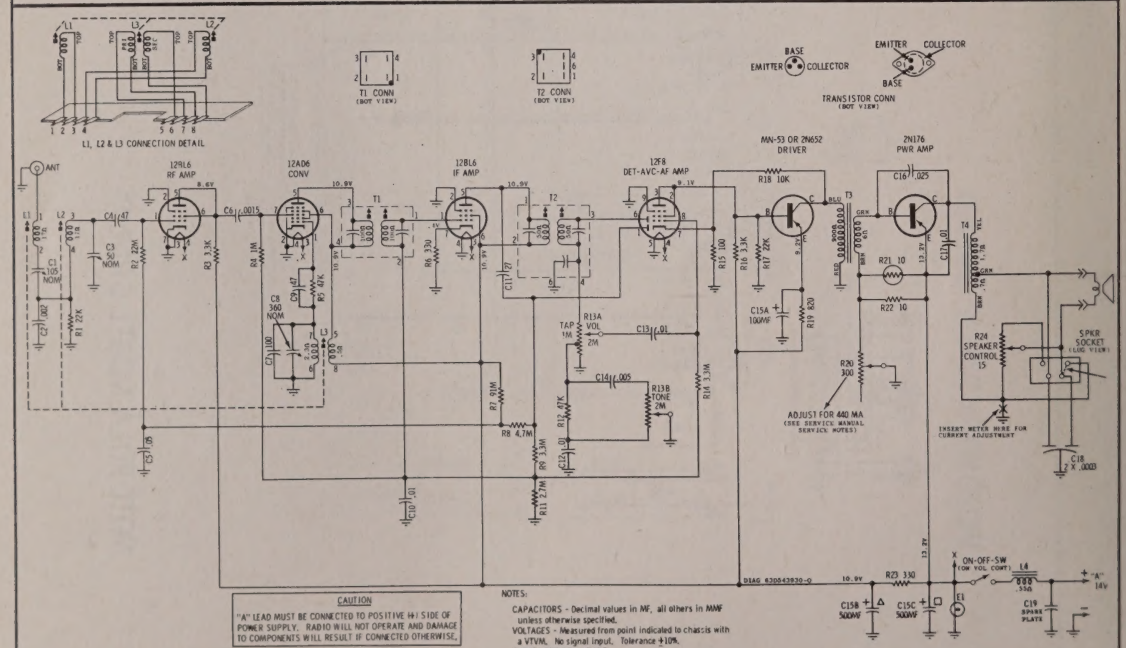
# MOTOROLA MODEL 500X

Schematic Diagram Courtesy of Motorola Inc.




# VOLKSWAGEN MODELS ROBT, ROBV

Schematic Diagram Courtesy of Bendix Radio Division: Bendix Aviation Corp.


L1, L2 & L3 CONNECTION DETAIL
T1 CONN (BOT VIEW)
T2 CONN (BOT VIEW)
TRANSISTOR CONN (BOT VIEW)
ANT
12RL6 RF AMP
12AD6 CONV
12BL6 IF AMP
12F8 DET-AVC-AF AMP
MN-53 OR 2N652 DRIVER
2N176 PWR AMP
ADJUST FOR 440 MA
INSERT METER HERE FOR CURRENT ADJUSTMENT
SPKR SOCKET
ON-OFF-SW
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM, No signal input. Tolerance ±10%.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.

# MOTOROLA MODEL OEA60X

Schematic Diagram Courtesy of Motorola Inc.